# HIGHLIGHTS

**REVISION NO. 33** Jun 01/10

Pages which have been revised are outlined below, together with the Highlights of the Revision

| CH/SE/SU C PAGES | REASON FOR CHANGE | EFFECTIVITY |
|---|---|---|
| CHAPTER 26 | | |
| L.E.P. 1- 5 | Revised to Reflect this revision indicating new,revised, and/or deleted pages | |
| T. OF C. 5- 7 | Revised to reflect this revision | |
| 26-12-20 501- 502 | Minor additions and amplification<br>**MODIFIED SNAPWIRE REFERENCE** | |
| 26-13-00 501, 508 | Layout Improved or Effectivity Updated | |
| 26-15-00 501- 502 | Minor additions and amplification<br>**CORRECTED REASON FOR THE JOB** | |
| 26-15-12 401, 404- 405 | Minor additions and amplification<br>**ADDED MATERIAL** | |
| 26-16-00 02 509- 512 | Minor additions and amplification<br>**DELETED MPD CROSS-REFERENCES** | |
| 26-21-00 01 505- 506, 510 | Minor additions and amplification<br>**DELETED MPD CROSS-REFERENCE** | |
| 26-21-13 401- 402, 405 | Minor additions and amplification<br>**UPDATED WARNING TO DELETE REFERENCE TO MANUFACTURER** | |
| 26-21-14 401, 403- 405, 407 | Effectivity updated at the bottom of the page<br>Minor, non technical corrections<br>**ADDED EQUIPMENT IN TABLE TO CHECK BOTTLE BONDING**<br>Minor additions and amplification<br>**DELETED REFERENCED PROCEDURE 26-21-13, P. BLOCK 401 IN EQUIPMENT AND MATERIAL TABLE** | |
| 26-21-15 | Minor additions and amplification | |



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| CH/SE/SU C PAGES | REASON FOR CHANGE | EFFECTIVITY |
|---|---|---|
| 401- 405 | ADDED WARNING RELATED TO CARTRIDGE ELECTRICAL PINS SHUNTING | |
| 26-22-00 512 | Minor additions and amplification IN COMPLIANCE WITH AUTHORING GUIDES | |
| 26-23-00 502- 505 | Minor additions and amplification TEXT REVISED | |
| 26-23-00 601- 602 | Layout Improved or Effectivity Updated | |

CHAPTER 26

FIRE PROTECTION

LIST OF EFFECTIVE PAGES

N, R or D indicates pages which are New, Revised or Deleted respectively
Remove and insert the affected pages and complete the Record of Revisions and the Record of Temporary Revisions as necessary

| CH/SE/SU | C | PAGE | DATE |
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| RECORD | | | |
| OF TEMP. | | | |
| REVISION | | | |
| L.E.P. | R | 1- 5 | Jun01/10 |
| T. of C. | | 1 | Jun01/04 |
| T. of C. | | 2 | Jun01/09 |
| T. of C. | | 3 | Jun01/08 |
| T. of C. | | 4 | Jun01/09 |
| T. of C. | R | 5 | Jun01/10 |
| T. of C. | R | 6 | Jun01/10 |
| T. of C. | R | 7 | Jun01/10 |
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CHAPTER 26

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| Inspection/Check | | | 601 | ALL |
| LAVATORY FIRE EXTINGUISHING | 26-25-00 | | | |
| Description and Operation | | | 1 | ALL |
| General | | | 1 | ALL |
| Component Description | | | 1 | ALL |
| Operation | | | 1 | ALL |
| Maintenance/Practices | | | 201 | ALL |




Printed in France

## 1. General

### A. Definition

The fire protection system enables the beginning of a fire or smoke to be detected, localized or neutralized quickly. It is a means to palliate possible fire consequences on the aircraft.

### B. Functions

The various purposes of the fire protection system are :

- to detect and extinguish any fire in each engine nacelle and in the APU compartment
- to protect engine pylons against any torch flame from the combustion chamber
- to detect presence of smoke in flight compartment panels, radar, electronics racks, minimum equipment bay, and inertial navigation system
- to detect smoke and extinguish fire in FWD, AFT and BULK cargo compartments
- to extinguish fire in lavatories
- to detect any leakage of hot air ducts
- to extinguish fire in passenger/crew compartments and other accessible areas in flight.

### C. Summary Description

R **ON A/C 101-200,

(Ref. Fig. 001)

R **ON A/C 001-100,

(Ref. Fig. 002)

R **ON A/C 101-200,

(Ref. Fig. 003)

R **ON A/C 001-100,

(Ref. Fig. 004)

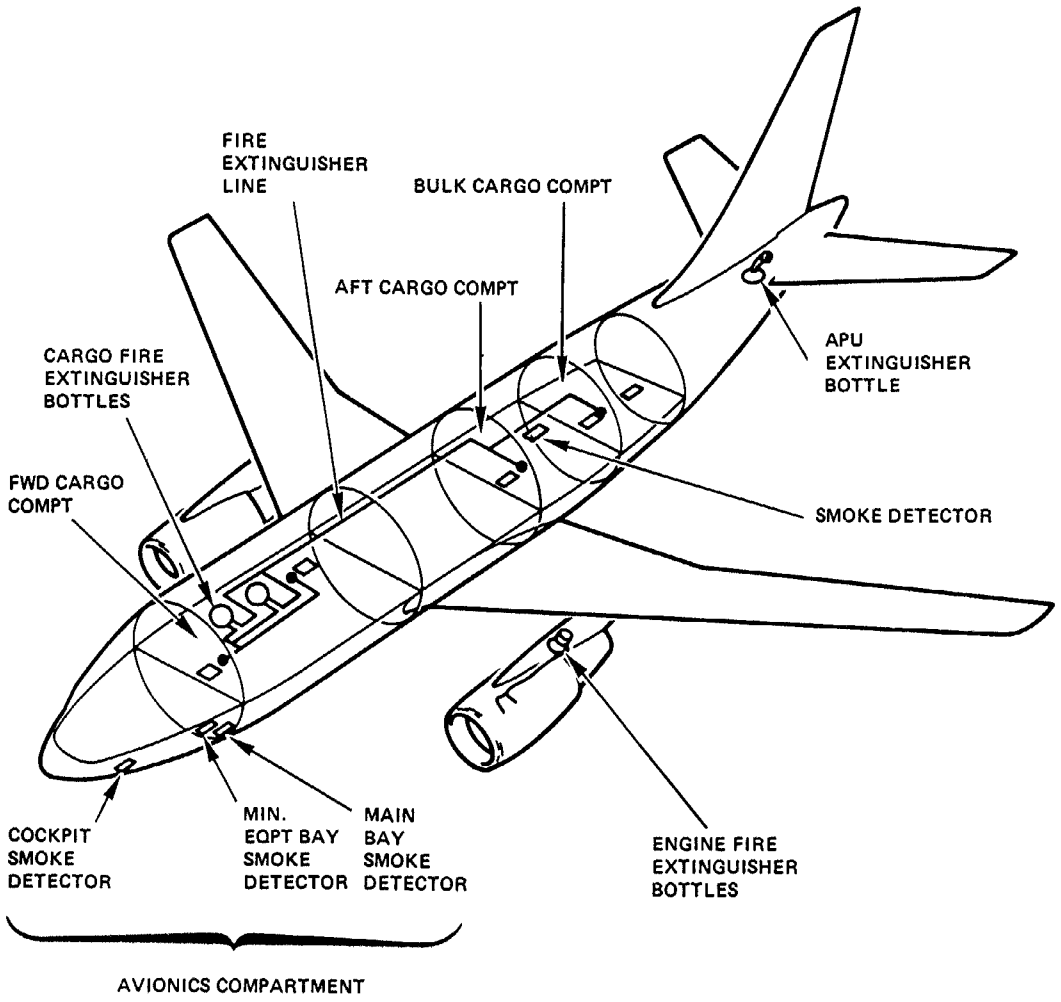
R **ON A/C ALL

Fire protection system is split into two main sub-systems which are :

- detection, covered in 26-10-00
- fire extinguishing, covered in 26-20-00

(1) Detections

Different means are used, depending on the aircraft area which is monitored




BM5 26 00 00 0 BARO-27-22
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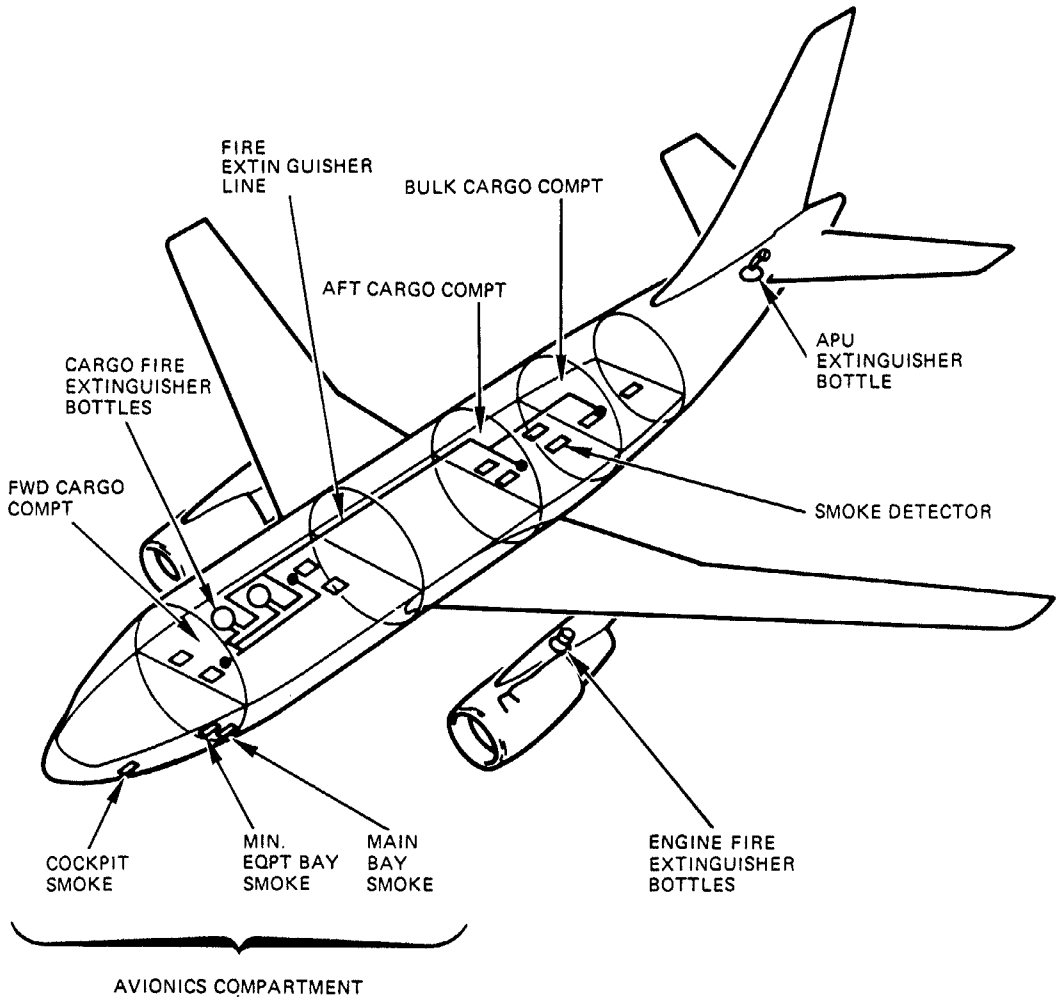
Fire Detection and Extinguishing Systems
Figure 001

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Fire Detection and Extinguishing Systems
Figure 002

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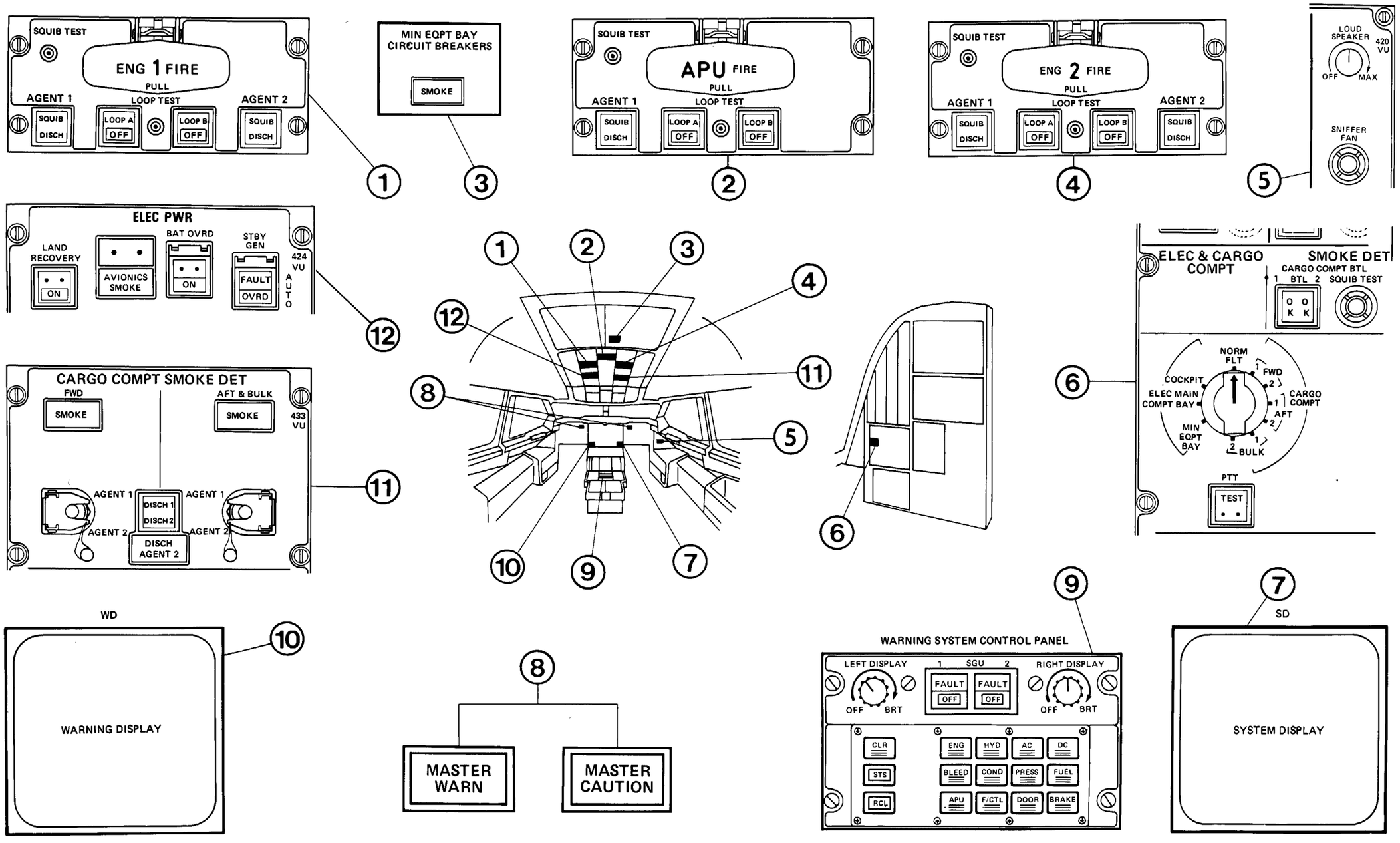


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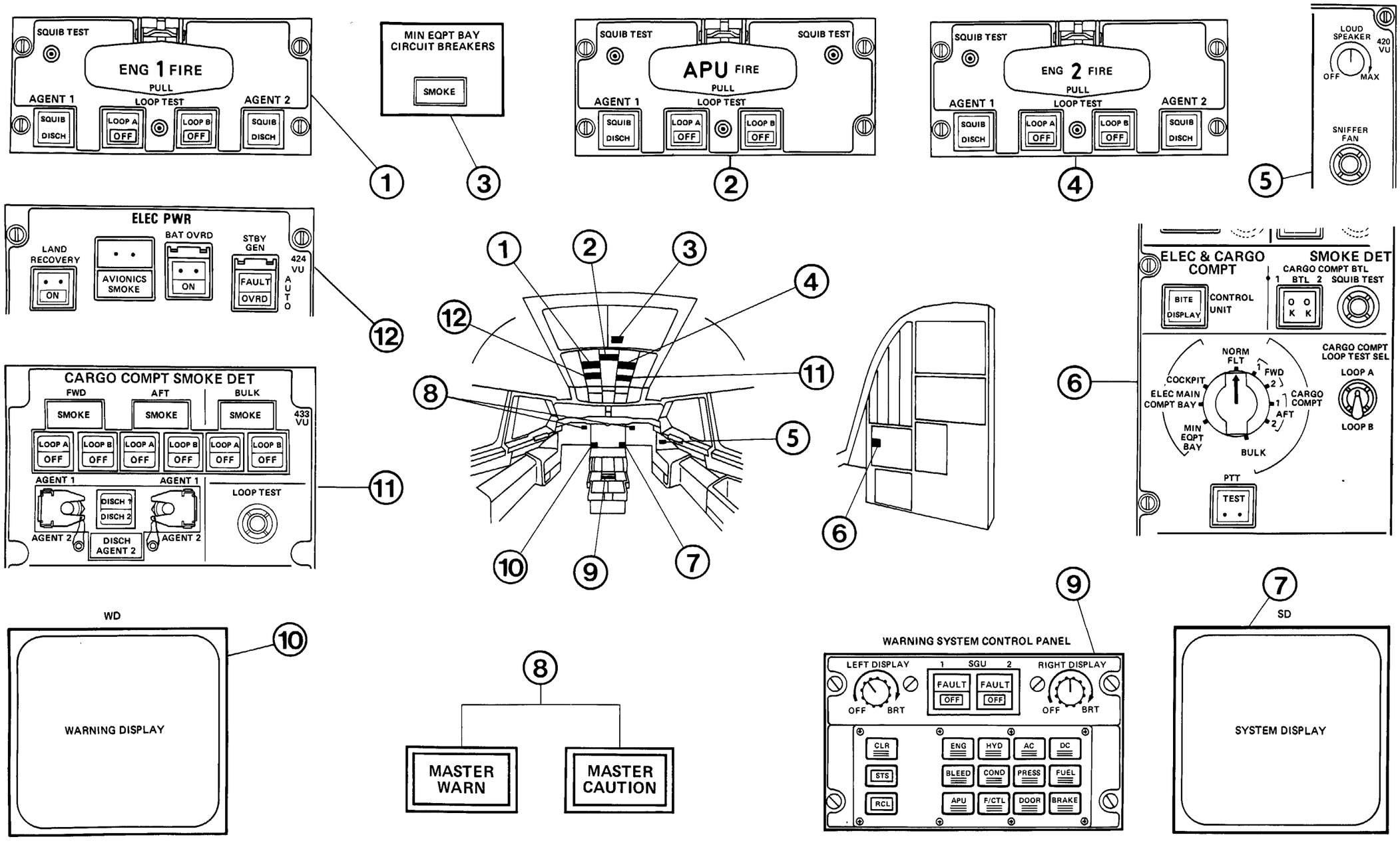
Component Location - Indicators and Controls
Figure 003

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Component Location - Indicators and Controls
Figure 004

- detection through thermo sensitive loops which trigger the warning by means of an electronic control unit for a certain temperature rise in the monitored area :
  . engine overheat and fire detection, covered in 26-12-00. The system is installed in each engine nacelle and is made up of two independent loops connected in parallel and according to an "AND" logic so as to avoid spurious fire warnings
  . APU overheat and fire detection covered in 26-13-00. The system monitors the whole APU compartment (fuel and air bleed systems) and, as for the engines, is made up of two loop so as to avoid spurious fire warnings
  . ambient overheat detection around hot air ducts, covered in 36-22-00 (this system is mentioned for reference only and is described in chapter 36)
- detection through smoke detectors which are sensitive to visible and invisible combustion gases and trigger a warning once the preset threshold is reached
  . avionics compartment smoke detection, covered in 26-15-00. Smoke detectors are installed on the various ventilation air extraction ducts and provide an individual sensing. A sniffer fan enables the olfactory confirmation of smoke presence.

R **ON A/C 101-200,

. cargo compartment smoke detection, covered in 26-16-00. These detectors are ambient smoke detectors installed in the cargo compartments. The warning, when triggered, causes the corresponding ventilation and heating system (if installed) to close.

R **ON A/C 001-100,

. cargo compartment smoke detection, covered in 26-16-00. These detectors are ambient smoke detectors installed in the cargo compartments : they function in pairs to avoid spurious SMOKE warnings and moreover, once the warning triggered cause the corresponding ventilation and heating system (if installed) to close. The electronic control unit is common for all cargo detectors.

R **ON A/C ALL

(2)Extinguishing

Several extinguishing methods are used according to the area in which the fire occurs and to the fact that the aircraft is in flight or on the ground.

For each method one or two fixed fire extinguisher bottle(s) or portable fire extinguisher(s) are used. They are operated either automatically and manually or manually only.

The function of the fixed equipment installed on board is to extinguish fire occurring in the following areas :

. engine nacelles, covered in 26-21-00. Each nacelle is fitted with an extinguishing system supplied by two bottles, the percussion of which

is controlled from the flight compartment.
The torch flame protection is a fire wall located in the pylon lower section which can resist the flames for five minutes approximately.

. APU compartment, covered in 26-22-00. The APU is fitted with an extinguishing system supplied by one bottle, the percussion of which can be controlled from the flight compartment, or from nose landing gear (on the ground).
. cargo compartments, covered in 26-23-00. The system comprises two bottles which are controlled from the flight compartment and spray extinguishing agent either in FWD cargo compartment or in AFT and BULK cargo compartments.

- portable equipment, covered in 26-24-00. These are small capacity fire extinguishers, operated manually and enabling crew intervention in the flight compartment, passenger cabin and avionics compartment.
  . lavatories, covered in 26-25-00. Extinguishing of a fire in a lavatory waste bin is provided by a bottle located over the waste pin. The fire extinguisher bottle is squibbed automatically by a thermal fuse and the extinguishing agent is directly sprayed into the waste bin.

D. Testing Method
Detection and extinguishing circuitry testing can be carried out using the corresponding pushbuttons on the overhead panel and controls located on the lateral maintenance panel.

**ON A/C 101-200,

Electrical Supply Table

- Smoke detection and extinguishing in avionics and cargo compartments

R
R

| BUSBAR | CIRCUIT BREAKER | VOLTAGE/SUPPLY | FUNCTION | ATA REF. |
|---|---|---|---|---|
| 303PP | 1WA | 28VDC | MIN EQPT BAY, COCKPIT, FWD/AFT/BULK cargo no. 1 detector supply | 26-15-00/ 26-16-00 |
| 306PP | 2WA | 28VDC | MAIN BAY, FWD/AFT/BULK cargo no. 2 detector supply | 26-15-00/ 26-16-00 |
| 303PP | 1WM | 28VDC/Emergency Smoke Drill | Cargo compartment fire extinguishing, bottle 1 | 26-23-00 |
| 401PP | 2WM | 28VDC/BAT 1 | Cargo compartment fire extinguishing, bottle 2 | 26-23-00 |
| 302XPB | 54WA | 115V-400Hz/ Normal | Sniffer Fan Supply | 26-15-00 |

R
R

**ON A/C 001-100,

Electrical Supply Table

- Smoke detection and extinguishing in avionics and cargo compartments

R
R

| BUSBAR | CIRCUIT BREAKER | VOLTAGE/SUPPLY | FUNCTION | ATA REF. |
|---|---|---|---|---|
| 303PP | 1WA | 28VDC | MIN EQPT BAY, COCKPIT detector supply | 26-15-00 |
| 306PP | 2WA | 28VDC | MAIN BAY detector supply | 26-15-00 |
| 303PP | 1WM | 28VDC/Emergency smoke drill | Cargo compartment smoke fire extinguishing, bottle 1 | 26-23-00 |
| 306PP | 35WH | 28VDC | Cargo compartment smoke detection control unit supply | 26-16-00 |
| 303PP | 46WH | 28VDC | Cargo compartment smoke detection control unit supply | 26-16-00 |
| 401PP | 2WM | 28VDC/BAT1 | Cargo compartment fire extinguishing, bottle 2 | 26-23-00 |
| 302XPB | 54WA | 115V-400Hz/ normal | Sniffer fan supply | 26-15-00 |

R
R

**ON A/C ALL

Electrical Supply Table

- Fire detection and extinguishing in engines and APU

R
R

| BUSBAR | CIRCUIT BREAKER | VOLTAGE/SUPPLY | FUNCTION | ATA REF. |
|---|---|---|---|---|
| 301PP | 1WG | 28VDC/Essential | APU fire detection - Loop A | 26-13-00 |
| | 3WG | 28VDC/Essential | APU fire indication | 26-13-00 |
| | 1WF | 28VDC/Essential | APU fire extinguishing supply - Shot 1 | 26-22-00 |
| | 3WF | 28VDC/Essential | Closing of APU isolation valve and APU fire detection control unit supply cutoff | 26-22-00 |
| | 30WF | 28VDC/Essential | Automatic APU fire extinguishing on the ground | 26-22-00 |
| 303PP | 1WD | 28VAC/Emergency Smoke Drill | Eng. 1 fire detection, Loop A | 26-12-00 |

| BUSBAR | CIRCUIT BREAKER | VOLTAGE/SUPPLY | FUNCTION | ATA REF. |
|---|---|---|---|---|
| | 3WD | 28VAC/Emergency Smoke Drill | Eng. 1 fire detection, Loop B | |
| | 5WD | 28VAC/Emergency Smoke Drill | Eng. 1 fire detection, fire handle | |
| | 2WD | 28VAC/Emergency Smoke Drill | Eng. 2 fire detection, Loop A | |
| | 4WD | 28VAC/Emergency Smoke Drill | Eng. 2 fire detection, Loop B | |
| | 6WD | 28VAC/Emergency Smoke Drill | Eng. 2 fire detection, fire handle | |
| 305PP | 1WE | 28VDC | Engine fire extinguishing, bottle 1 | 26-21-00 |
| | 3WE | 28VDC | Engine fire extinguishing, bottle 2 | 26-21-00 |
| | 2WG | 28VDC | APU fire detection, Loop B | 26-13-00 |
| | 2WF | 28VDC | APU fire extinguishing - Fire extinguisher (bottle - shot 2) | 26-22-00 |
| | 4WF | 28VDC | Closing of APU isolation valve and APU fire detection control unit supply cutoff | 26-22-00 |
| | 7WF | 28VDC | Indication and control of APU fire extinguishing | 26-22-00 |
| 401PP | 5WE | 28VDC/BAT 1 | Engine fire extinguishing, bottle 1 | 26-12-00 |
| 402PP | 7WE | 28VDC/BAT 2 | Engine fire extinguishing, bottle 2 | 26-12-00 |

R

**ON A/C 001-100,

(Ref. Fig. 005)

**ON A/C 101-200,

(Ref. Fig. 006)

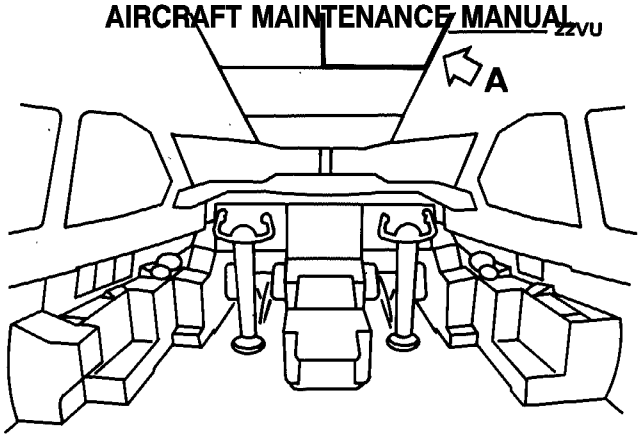
**ON A/C 001-100,

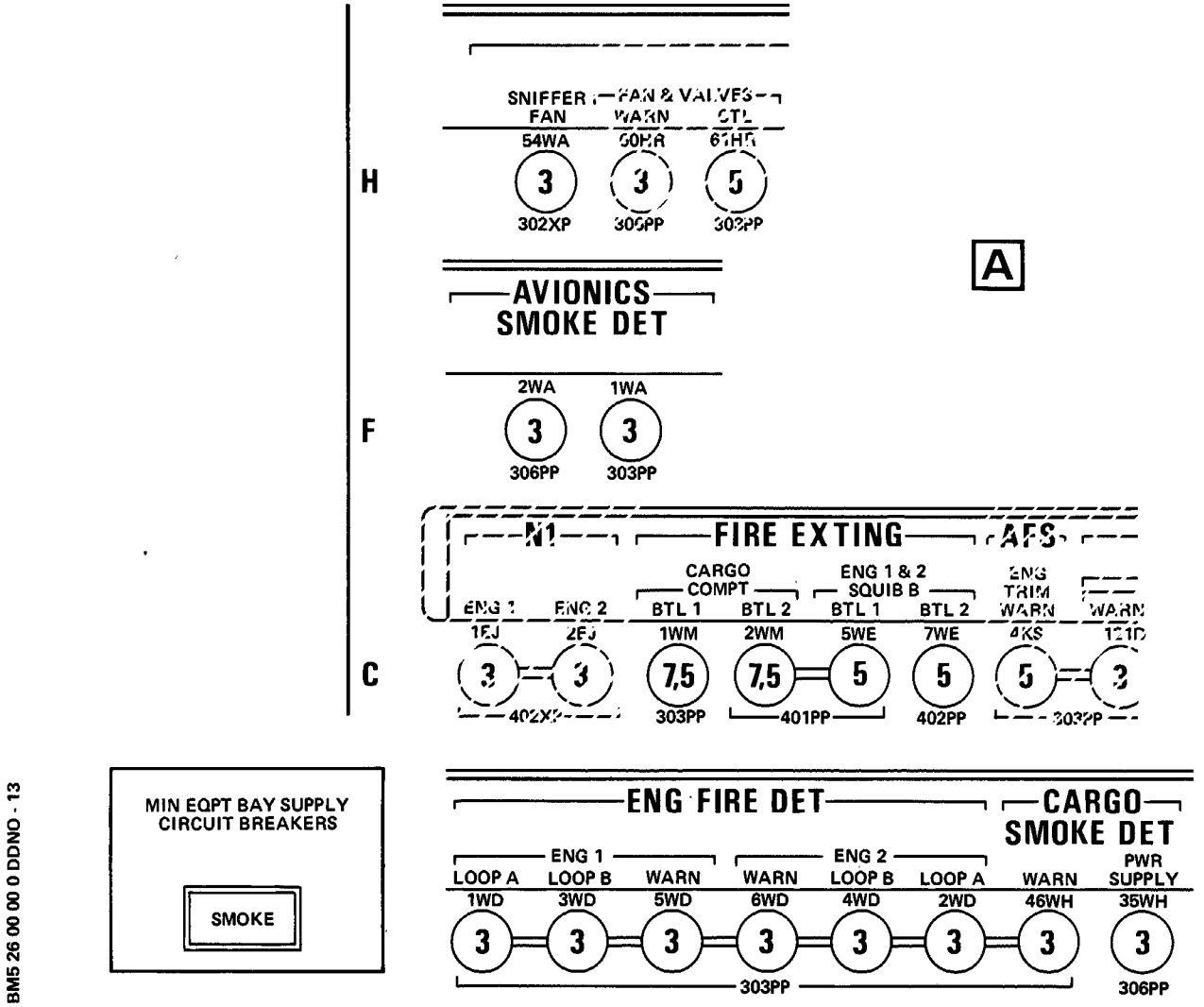
(Ref. Fig. 007)

**ON A/C 101-200,

(Ref. Fig. 008)

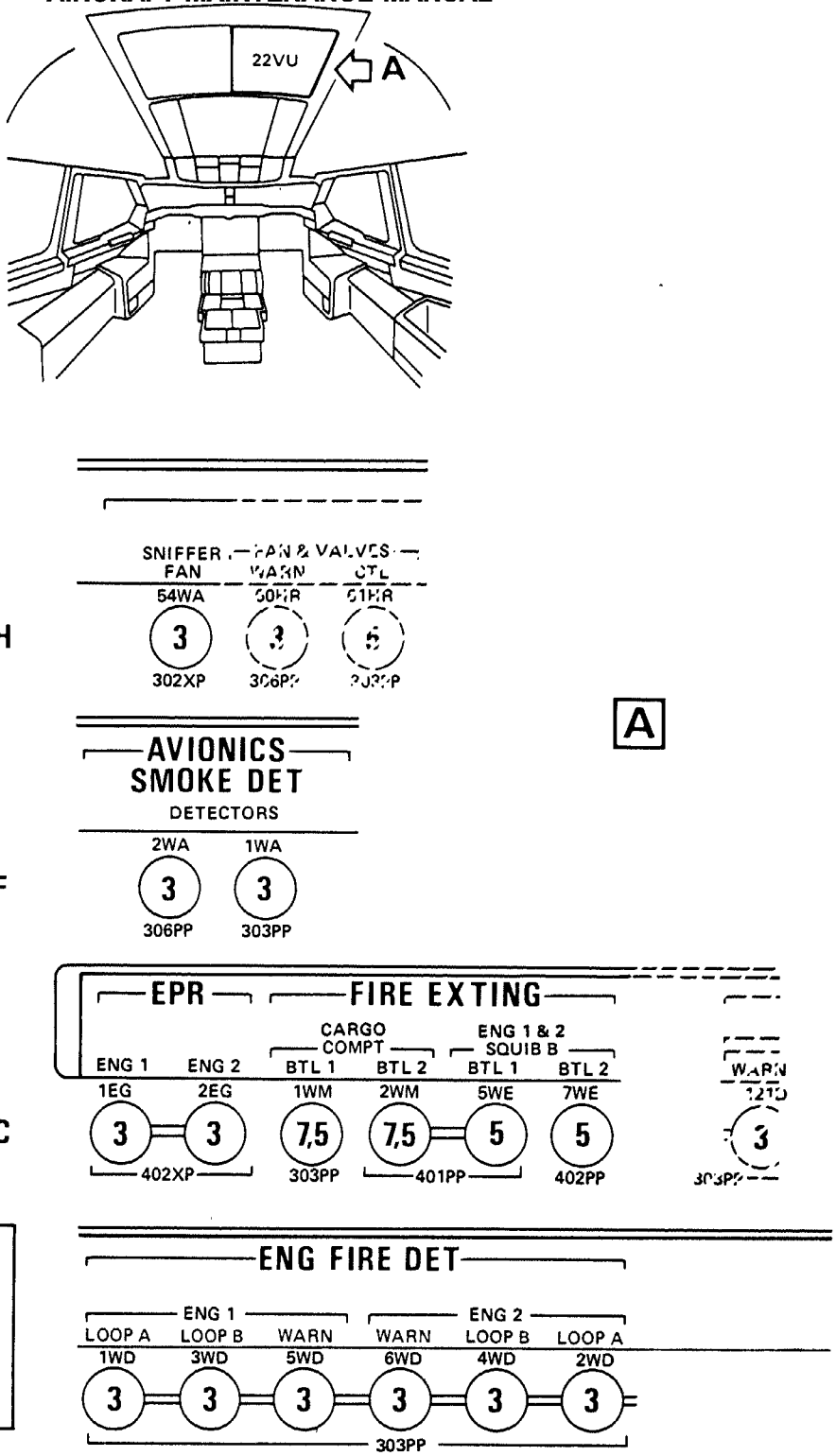
**ON A/C ALL



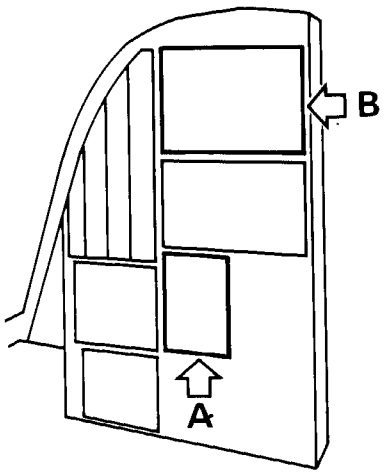




BM5 26 00 00 0 DDNO - 13

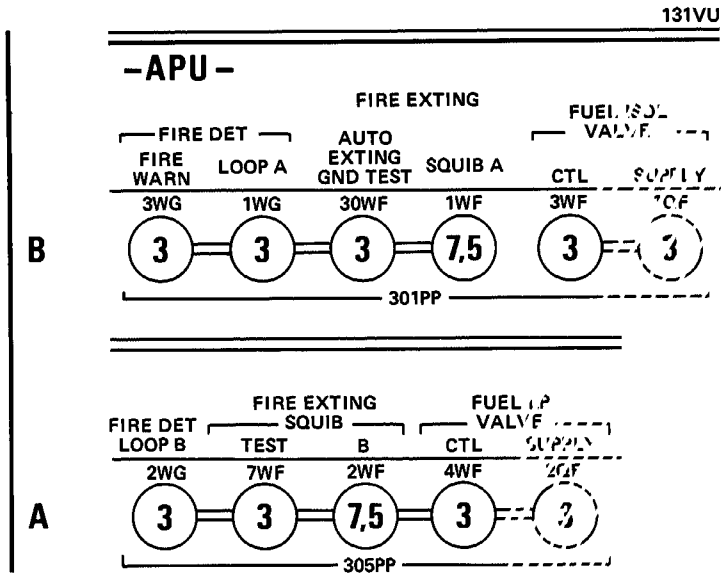
Component Location - Circuit Breaker Overhead
Panel 22VU
Figure 005



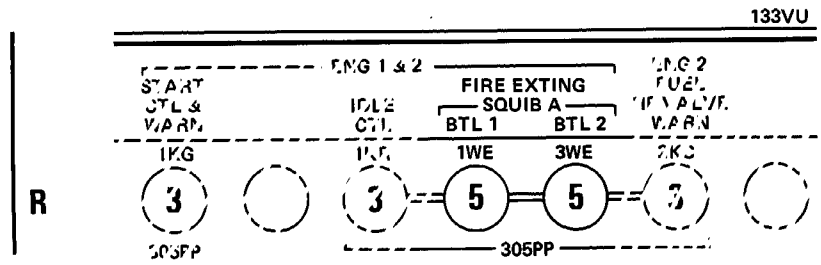

Component Location - Circuit Breaker Overhead
Panel 22VU
Figure 006



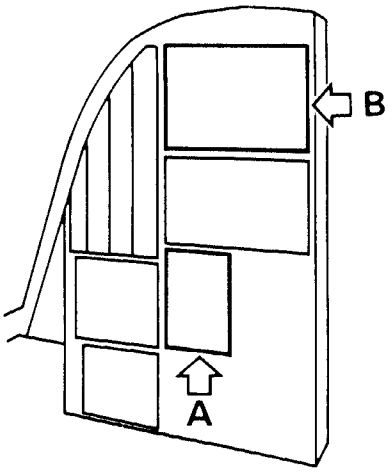

A



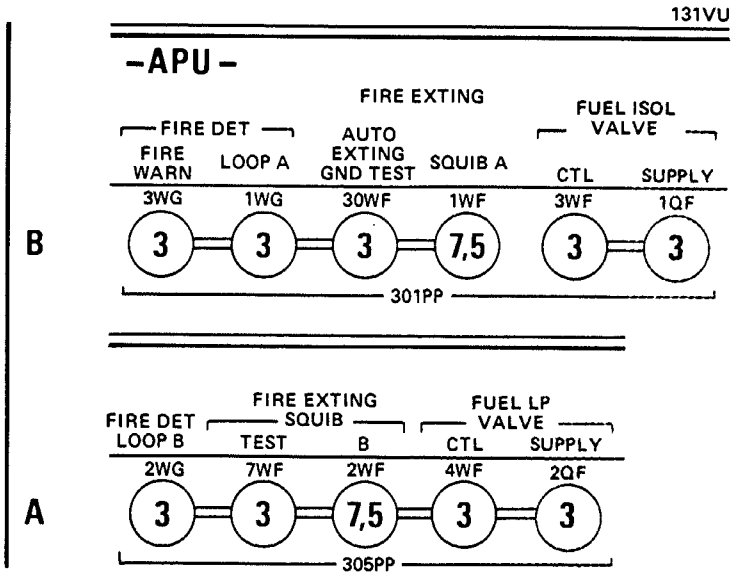

B



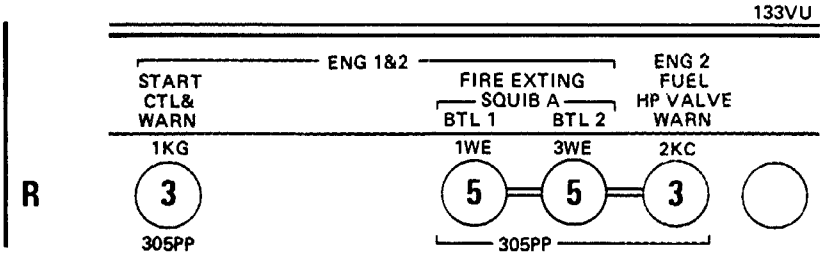

Component Location - Circuit Breaker Lateral
Panels 131VU and 133VU
Figure 007




A




B




BM5 26 00 00 0 AEPO-19

Component Location - Circuit Breaker Lateral
Panels 131VU and 133VU
Figure 008

(Ref. Fig. 009)
(Ref. Fig. 010)

**ON A/C 101-200,

(Ref. Fig. 011)

**ON A/C 001-100,

(Ref. Fig. 012)

**ON A/C ALL

2. Controls and Indicating
The following pages describe briefly the operation and utilization of the panels in flight compartment.

A. On the Overhead Panel
(1)For smoke detection in the avionics compartment
(2)For smoke detection in cargo compartments.

B. On Lateral Panel
For smoke detection in avionics and cargo compartments.
(Ref. Fig. 013)
- **AVIONICS SMOKE** warning light (Red) (2)
Comes on accompanied by **MASTER WARN** light flashing on **CAPT** and **F/O** main instrument panels **3VU** and **5VU** and repetitive chime when smoke is detected in ventilation duct proceeding from flight compartment and radar transceiver or from avionics compartment.
(Ref. Fig. 014)
- **LAND RECOVERY** pushbutton switch (4)
Released out is its normal position.
When pressed in **ON** legend (white) comes on to indicate that equipment necessary for the approach phase is restored to normal operating conditions (Ref. 24-00-00, 34-00-00).
(Ref. Fig. 015)
- **OVRD SUPPLY** 1 (or 2) pushbutton switch (1)
Used in the case of avionics smoke warning.
Released out is its normal position
NOTE : Switches are protected by a guard.
When pressed in, **ON** legend (white) comes on. Both switches pressed in, **AC BUS1**, **AC BUS2**, and **DC** normal bus are isolated. **GEN1** supplies **AC ESS BUS** and **GEN2** is in standby
(Ref. Fig. 016)
- **SMOKE** warning light (Red) (1)
Comes on accompanied by **MASTER WARN** light flashing on **CAPT** and **F/O** main instrument panels **3VU** and **5VU** and repetitive chime when smoke is detected in the ventilation duct proceeding from the minimum equipment bay.
- **SNIFFER FAN** pushbutton switch (2)

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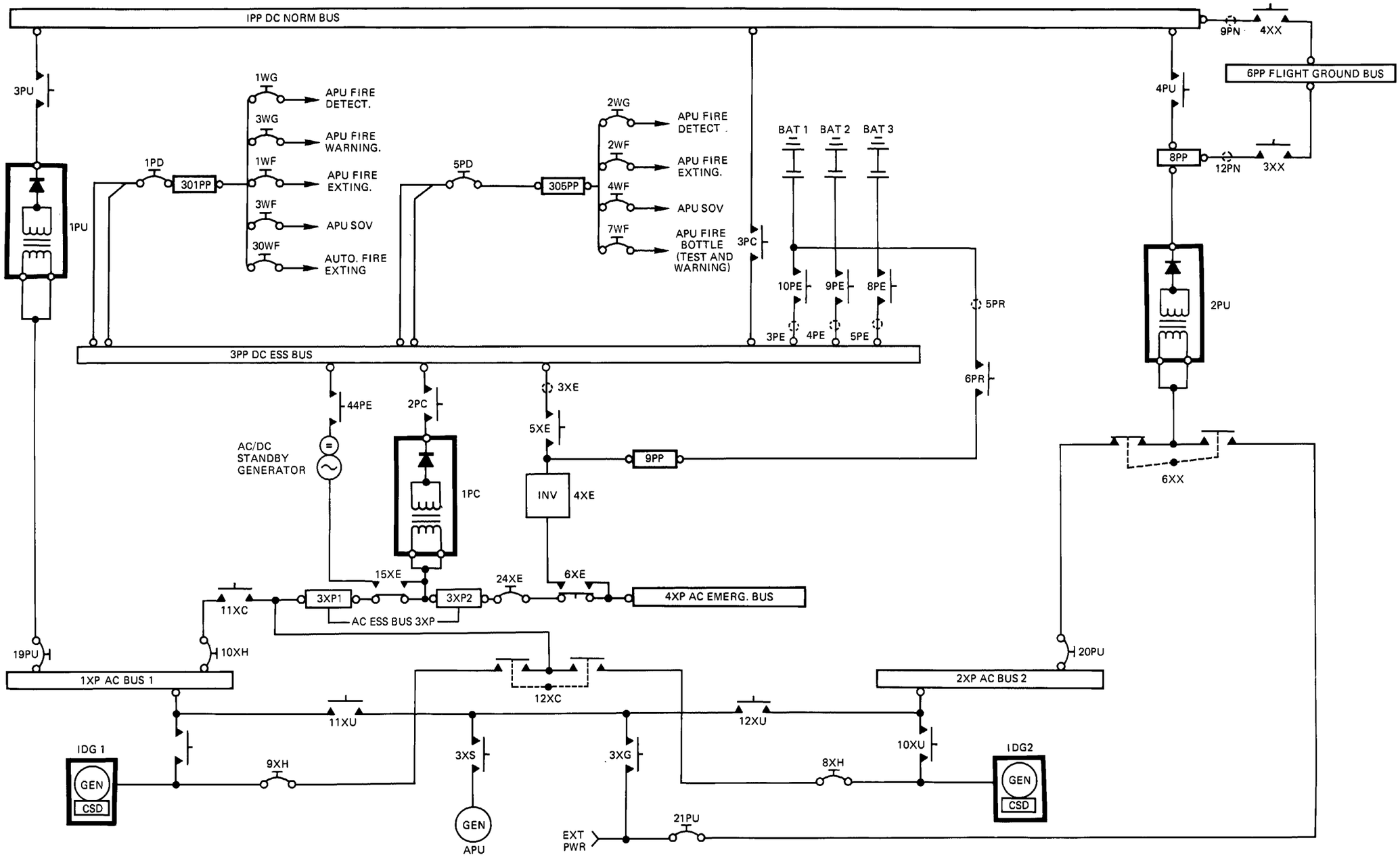


BM5 26 00 00 0 CHMO - 17 - 13
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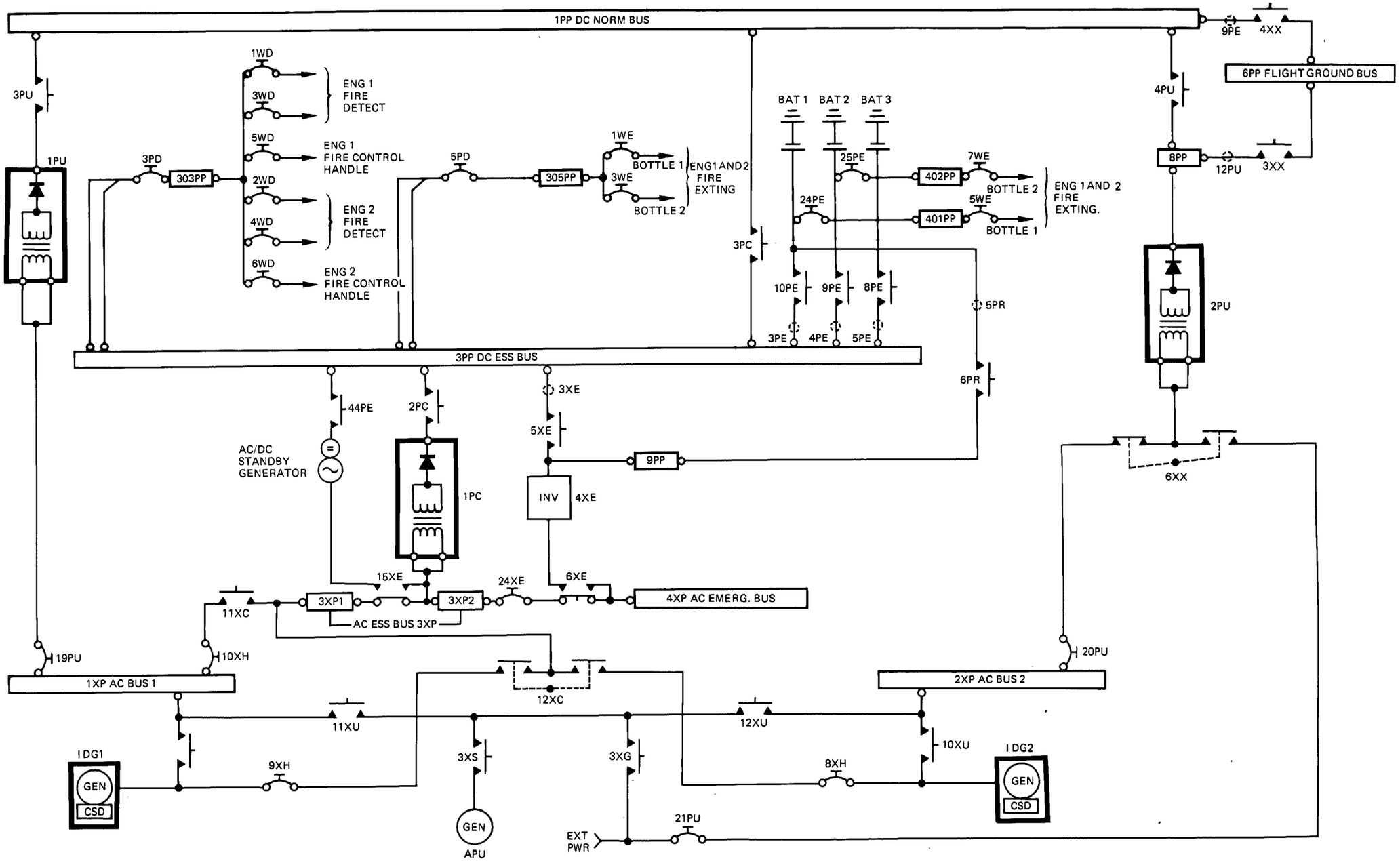
APU Fire Protection System - Electrical Supply
Figure 009

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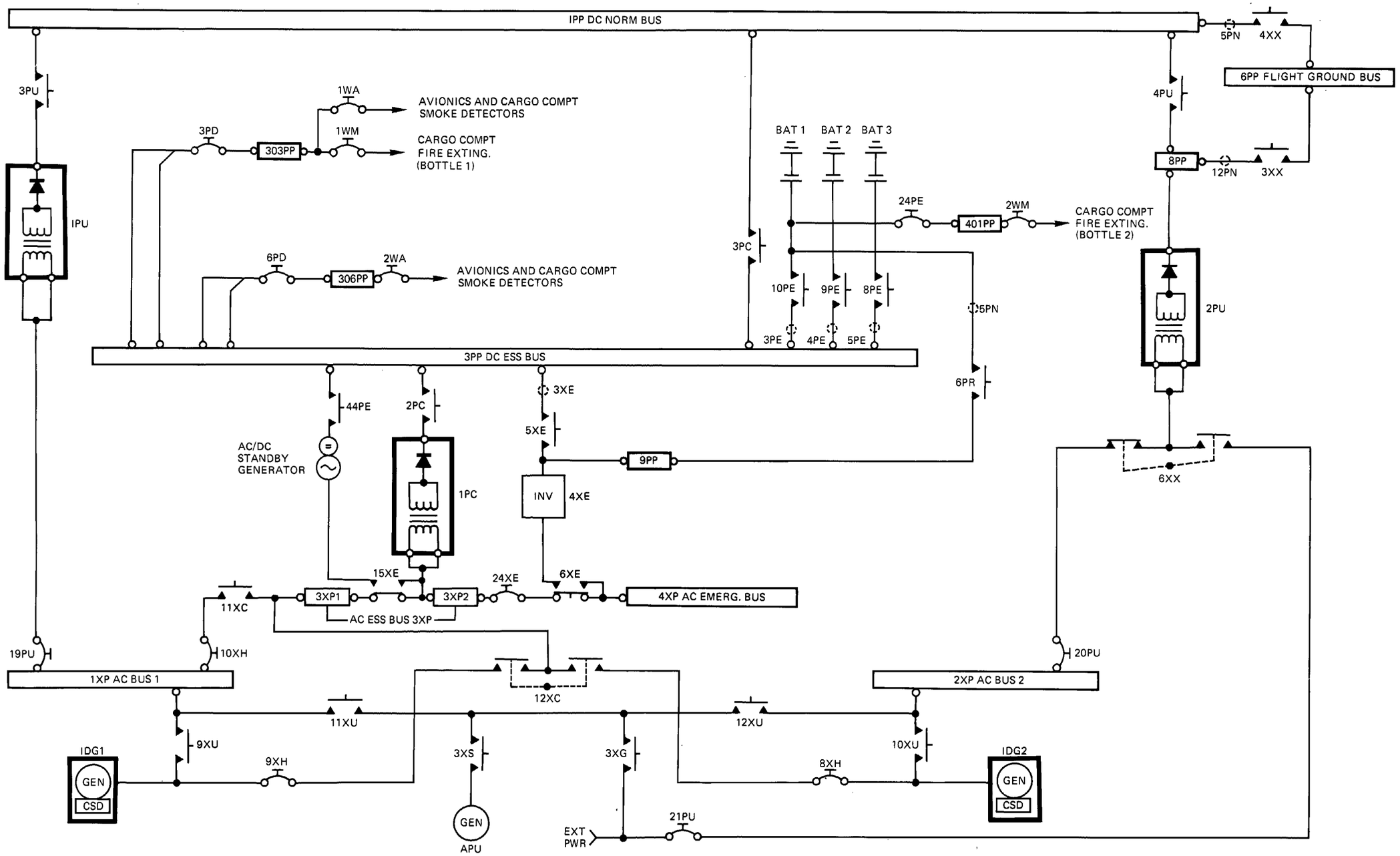
Engine Fire Protection System - Electrical Supply
Figure 010

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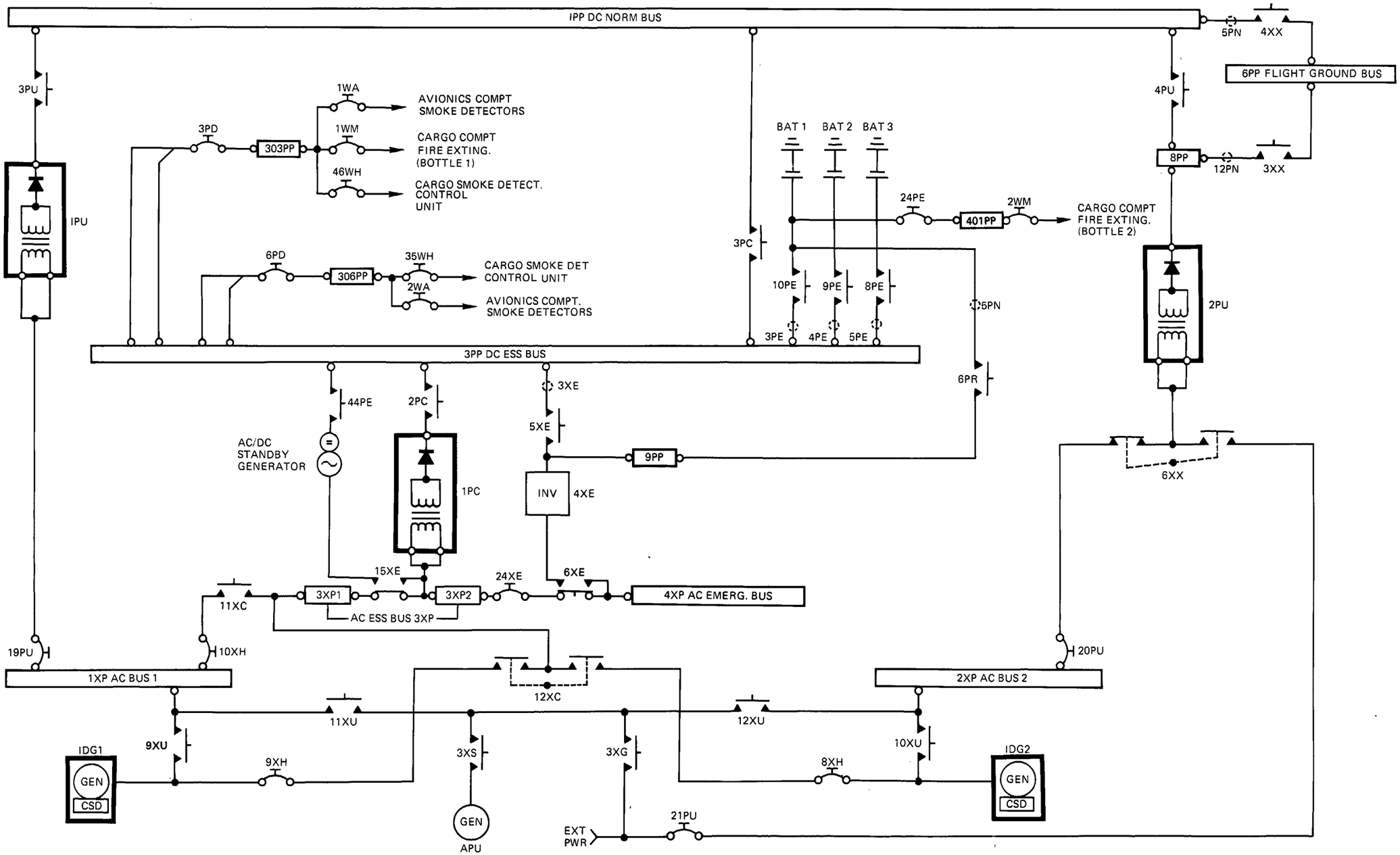
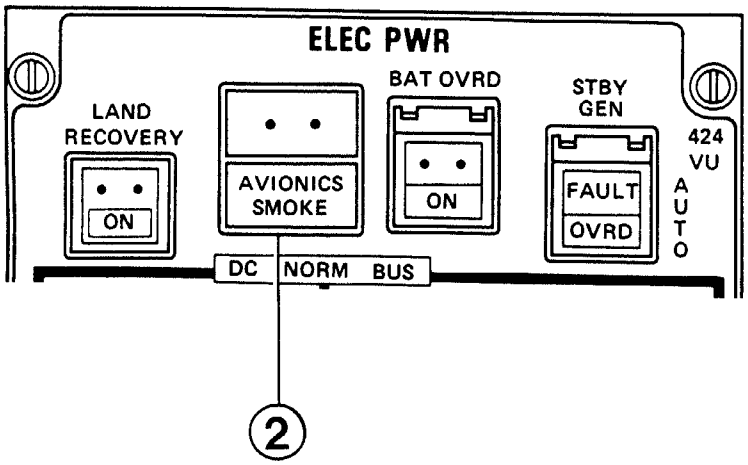
Avionics and Cargo Compt Smoke Detection System
Electrical Supply
Figure 011




Avionics and Cargo Compt Smoke Detection System
Electrical Supply
Figure 012

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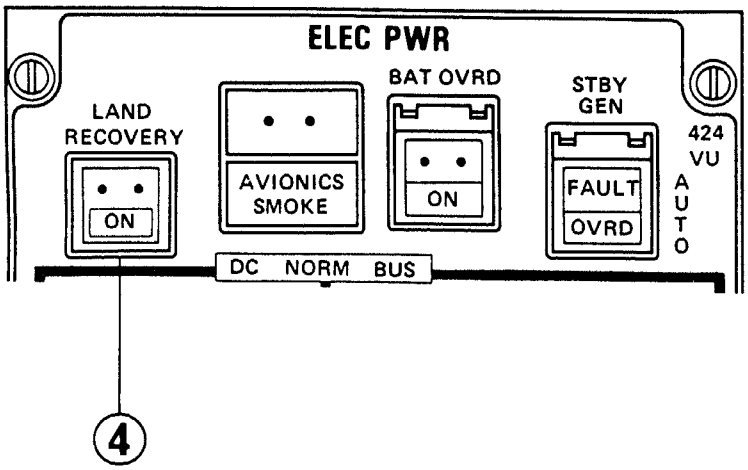
DM5

Avionics Compartment Smoke Detection Indicators
Figure 013




BM5 26 00 00 0 BKRO-27-21
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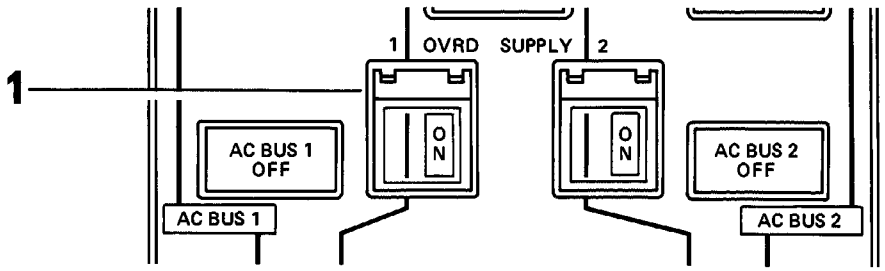
Avionics Compartment Smoke Detection Indicators
Figure 014




BM5 26 00 00 0 AXMO
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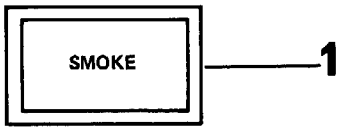
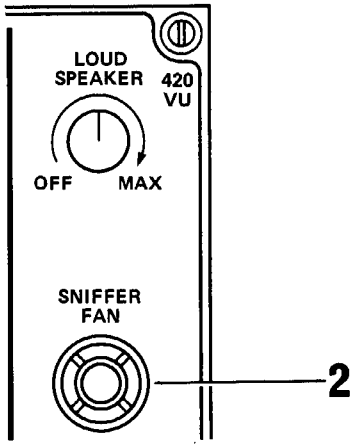
ELEC PWR/OVRD SUPPLY Pushbutton Switches
Figure 015

MIN EQPT BAY
CIRCUIT BREAKERS




MIN EQPT BAY SMOKE INDICATOR




SNIFFER FAN PUSHBUTTON SWITCH

BM5 26 00 00 0 TLNO - 13 - 08
DM5

Minimum Equipment Bay SMOKE Detection
Figure 016

When pressed, operates the fan which draws air towards the flight compartment so that the presence of smoke upstream of the avionics compartment battery fan may be confirmed.

**ON A/C 101-200,

(Ref. Fig. 017)

**ON A/C 001-100,

(Ref. Fig. 018)

**ON A/C 101-200,

- SMOKE warning light (Red) (1)
Comes on accompanied by MASTER WARN light flashing on CAPT and F/O main instrument panels 3VU and 5VU and repetitive chime, when smoke is detected.
NOTE : In the case of BULK smoke warning :
AIR COND page synoptic is displayed on R ECAM display unit.
The associated cargo compartment isolation and trim air valves close.

**ON A/C 001-100,

- SMOKE Warning light (Red) (1)
Comes on accompanied by MASTER WARN light flashing on CAPT and F/O main instrument panels 3VU and 5VU and repetitive chime, when smoke is detected :
- Both loop with both loops activated
- Loop A(B) with loop B(A) deactivated
NOTE : In the case of BULK smoke warning :
AIR COND page synoptic is displayed on R ECAM display unit.
The associated cargo compartment isolation and trim air valves close.

**ON A/C 101-200,

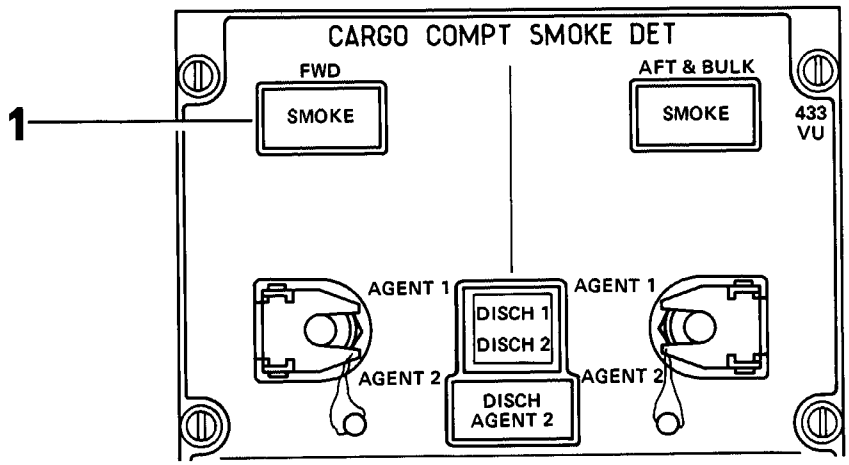
(Ref. Fig. 019)

**ON A/C 001-100,

(Ref. Fig. 020)

**ON A/C 101-200,

- FWD CARGO COMPT AGENT discharge switch (2)
Normally guarded and wirelocked.
AGENT 1(2) - Discharges bottle 1 (2) into FWD cargo compartment
- AFT and BULK CARGO COMPT AGENT discharge switch (3)
Normally guarded and wirelocked




BM5 26 00 00 0 BNHO - 10 - 06
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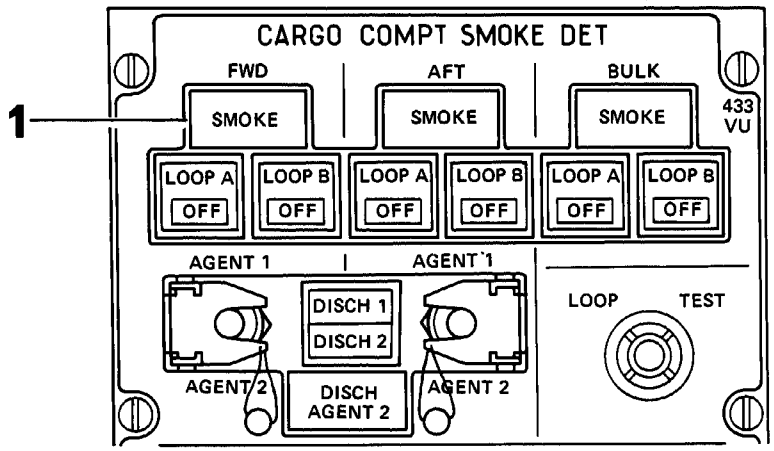
Cargo Compartment Fire Protection - Indicators and Controls
Figure 017




BM5 26 00 00 0 ANHO
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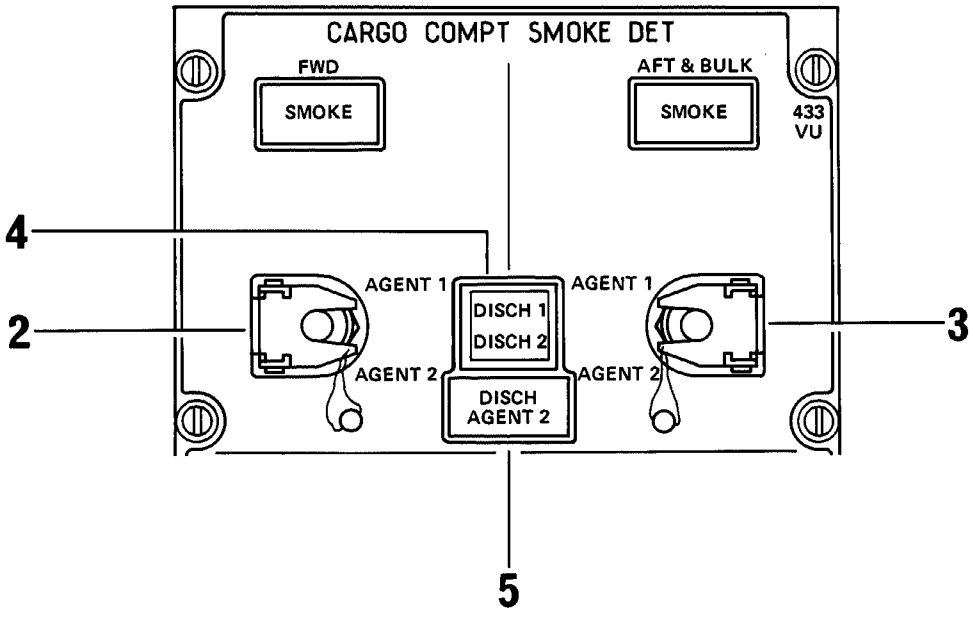
Cargo Compartment Fire Protection - Indicators and Controls
Figure 018

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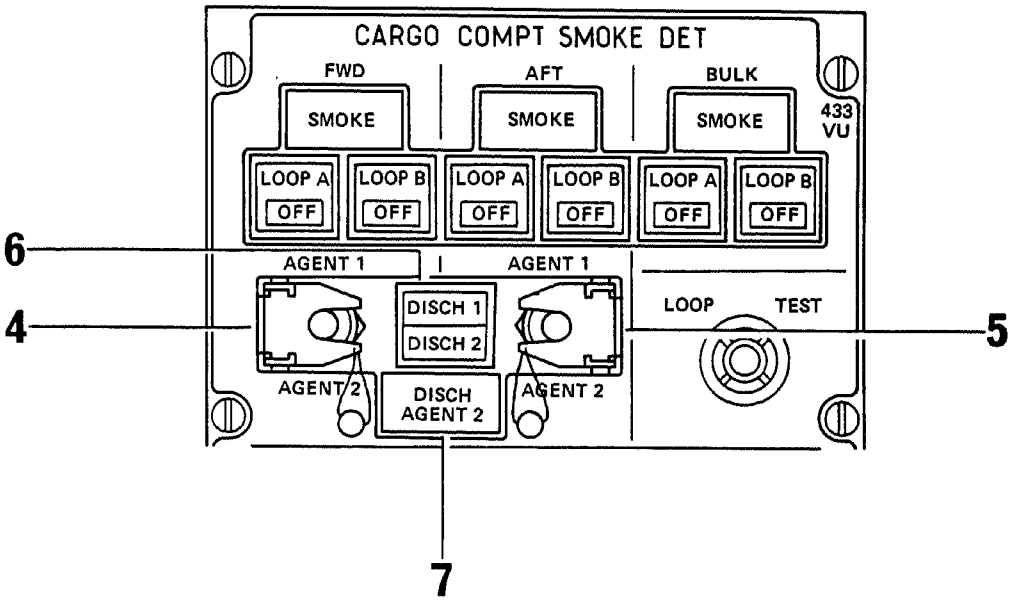
Cargo Compartment Fire Protection - Indicators and Controls
Figure 019

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Cargo Compartment Fire Protection - Indicators and Controls
Figure 020

AGENT 1(2) - Discharges bottle 1(2) into AFT and BULK cargo compartment.

- DISCH warning light - (Amber) (4)
  DISCH 1(2) legend comes on when bottle 1(2) is discharged.
  NOTE : Depending on temperature and pressure, the bottle may take up to 1 minute to fully discharge.
- DISCH AGENT 2 warning light - (Amber) (5)
  Comes on 60 minutes after bottle 1 has been discharged to remind crew to discharge bottle 2 so as to maintain the concentration of fire extinguishing agent into cargo compartment(s).

**ON A/C 001-100,

- LOOP pushbutton switch (2)
  Pressed in is its normal position (Loops activated)
  LOOP A (B) legend (amber) comes on when the corresponding loop detects smoke :
  - accompanied by the associated cargo compartment smoke warning if :
    - both loops detect smoke
    - one loop detects smoke if the other loop is deactivated
  - accompanied by MASTER CAUTION light flashing on CAPT and F/O main instrument panels 3VU and 5VU and single chime if one loop detects smoke with both loops activated.

  When released out :
  OFF legend (white) comes on, the corresponding loop is deactivated, and LOOP A (B) warning light inhibited.
- LOOP TEST pushbutton switch (3)
  When pressed checks smoke detection system operation.
  All loops activated :
  All loop lights come on accompanied by cargo smoke warnings.
  Loop A (B) activated and loop B (A) deactivated.
  Loop A (B) warning lights come on accompanied by cargo smoke warnings.
  NOTE : During the test
  - AIR COND page synoptic is displayed on R ECAM display unit.
  - BULK cargo compartment isolation and trim air valves close.
- FWD CARGO COMPT agent discharge switch (4)
  Normally guarded and wirelocked.
  AGENT 1(2) - Discharges bottle 1(2) into FWD cargo compartment
- AFT and BULK CARGO COMPT agent discharge switch (5)
  Normally guarded and wirelocked
  AGENT 1(2) - Discharges bottle 1(2) into AFT and BULK cargo compartment.
- DISCH warning light - (Amber) (6)
  DISCH 1(2)comes on when bottle 1(2) is discharged.
  NOTE : Depending on temperature and pressure, the bottle may take up to 1 minute to fully discharge.
- DISCH AGENT 2 warning light - (Amber) (7)
  Comes on 60 minutes after bottle 1 has been discharged to remind the crew to discharge bottle 2 so as to maintain concentration of fire extinguishing agent into cargo compartment(s).

**ON A/C 101-200,

(Ref. Fig. 021)

**ON A/C 001-100,

(Ref. Fig. 022)

**ON A/C 101-200,

- SQUIB TEST pushbutton switch (1)
  When pressed checks electrical continuity of both discharge heads of both fire extinguisher bottles.
- CARGO COMPT BTL 1(2) annunciator (2)
  OK legend (white) comes on during squib test if test is satisfactory.

**ON A/C 001-100,

- CONTROL UNIT/ELEC (CARGO) MFA (1)
  Comes on if a fault occurs in corresponding control unit or associated detection system.
- SQUIB TEST pushbutton switch (2)
  When pressed checks electrical continuity of both discharge heads of both fire extinguisher bottles.
- CARGO COMPT BTL 1(2) annunciator (3)
  OK legend (white) comes on during squib test if test is satisfactory.

**ON A/C 101-200,

(Ref. Fig. 023)

**ON A/C 001-100,

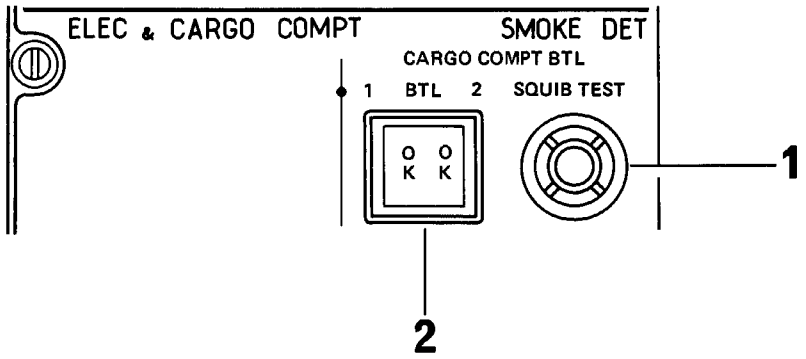
(Ref. Fig. 024)

**ON A/C 101-200,

- Smoke detector test selector switch (1)
  NORM FLT is its normal position.
  It selects smoke detect circuit to be tested.
- PTT pushbutton switch (2)
  TEST legend (white) comes on when selector switch is not in NORM FLT position.
  When pressed, if circuit satisfactory, activates :
  - corresponding SMOKE warnings for avionics compartment
  - corresponding LOOP warning light for cargo compartment.

**ON A/C 001-100,

- Smoke detector test selector switch (1)
  NORM FLT is its normal position
  Selects smoke detect circuit to be tested.
- CARGO COMPT LOOP TEST SEL switch (2)

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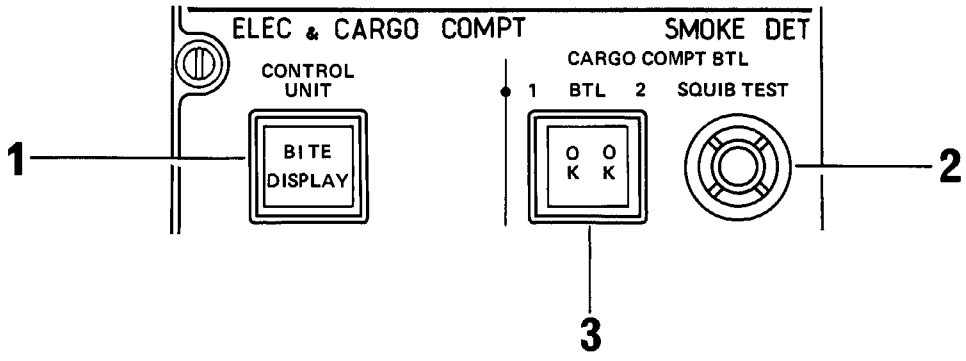
Control Unit and Extinguishing Equipment Circuitry Test
Figure 021

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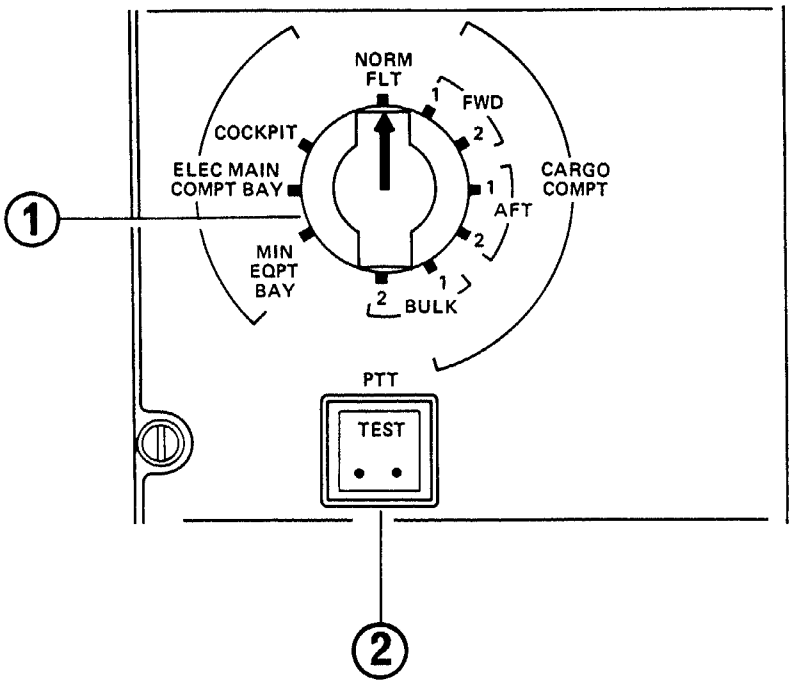
Control Unit and Extinguishing Equipment Circuitry Test
Figure 022

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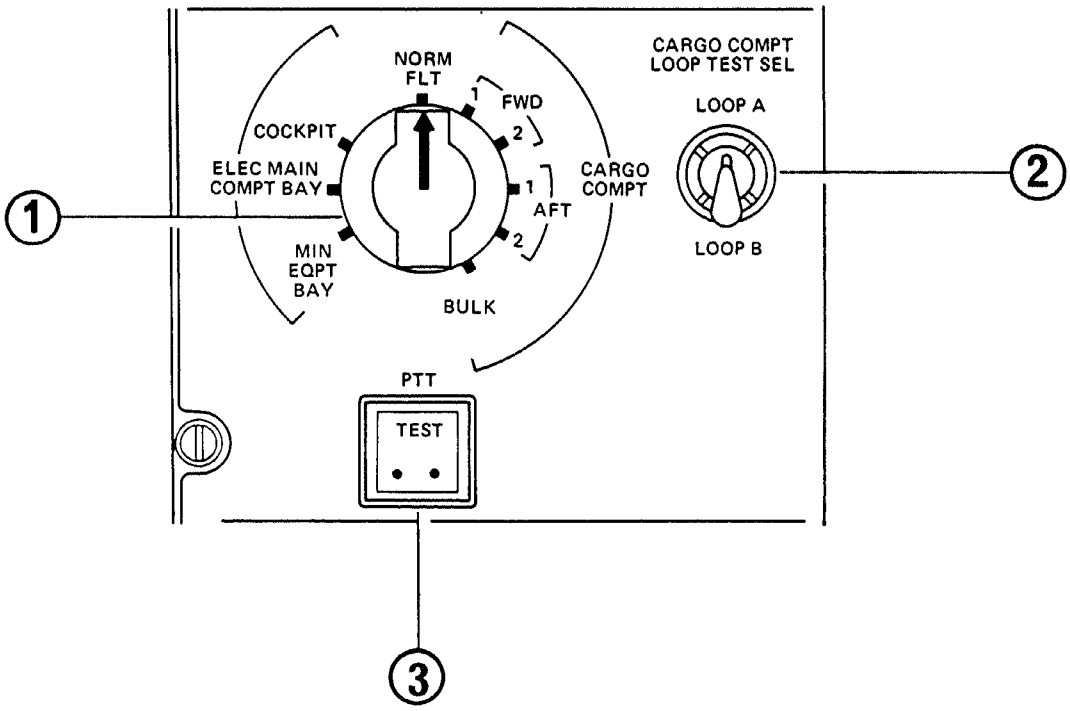
Avionics and Cargo Smoke Detection Test Controls and Indicators
Figure 023

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Avionics and Cargo Smoke Detection Test Controls and Indicators
Figure 024

LOOP A(B) selects LOOP A(B) for testing.

- PTT pushbutton switch (3)
  TEST legend (white) comes on when selector switch not in NORM FLT position.
  When pressed, if the circuit is satisfactory, activates :
  - corresponding SMOKE warnings for avionics compartment
  - corresponding LOOP warning light for cargo compartment.

1. Reason for the Job

A. Check of aircraft fire detection and extinguishing systems, either after removal/installation of a component or within a scheduled inspection.

2. Check

A. Overheat and Fire Detection Loops
(1)Check that there are no folds or cuts or excessive bend radii.
(2)Check the loops for marks caused by tools, exposure to excessive temperature or contact with aircraft structure or any item of aircraft equipment.
(3)Check loop supports and union safety devices for correct condition.
(4)When replacing a detection loop, make certain that loop mounting supports are in correct position.
(5)Periodically check that hot air ducts in the vicinity of detection loops do not leak (cracks, incorrectly fitted seals, worn seals, incorrectly tightened clamps, etc.).

B. Electronic Unit and Electrical Cables
(1)Check that electronic units are correctly secured and show no sign of shocks or corrosion.
(2)Check that electrical connectors are correctly connected and safetied (if necessary).
(3)Check electrical cables for correct condition (no trace of hydraulic fluid, cuts or crushing).

C. Extinguisher Bottles and Discharge Lines
(1)Check supports and fitting attachments for correct condition (no sign of cracks ; check of attaching bolts).
(2)Check that discharge lines are correctly secured and show no sign of cracks or breaks.
(3)Check that discharge line nozzles are not clogged.
(4)Check fire extinguisher bottles for any sign of dents or corrosion.
(5)Check weight of fire extinguisher bottles.

1. Smoke Detection

A. Location of Smoke Detectors and Associated Panels
Location of duct smoke detectors in avionics compartment and indicating and monitoring panels in flight compartment is shown on following figure. Same components, for cargo compartment ambient smoke detectors.
(Ref. Fig. 001)

R **ON A/C 101-200,

(Ref. Fig. 002)

R **ON A/C 001-100,

(Ref. Fig. 003)

R **ON A/C ALL

B. Principle of Smoke Detection Operation
These sub-systems allow the outbreak of fire in the avionics and cargo compartments to be detected.
(1)The avionics compartment sub-system comprises smoke detectors installed on the extraction ducts. When the threshold of the detector is exceeded the smoke warnings are triggered.

R **ON A/C 101-200,

(Ref. Fig. 004)

R **ON A/C 001-100,

(Ref. Fig. 005)

R **ON A/C ALL

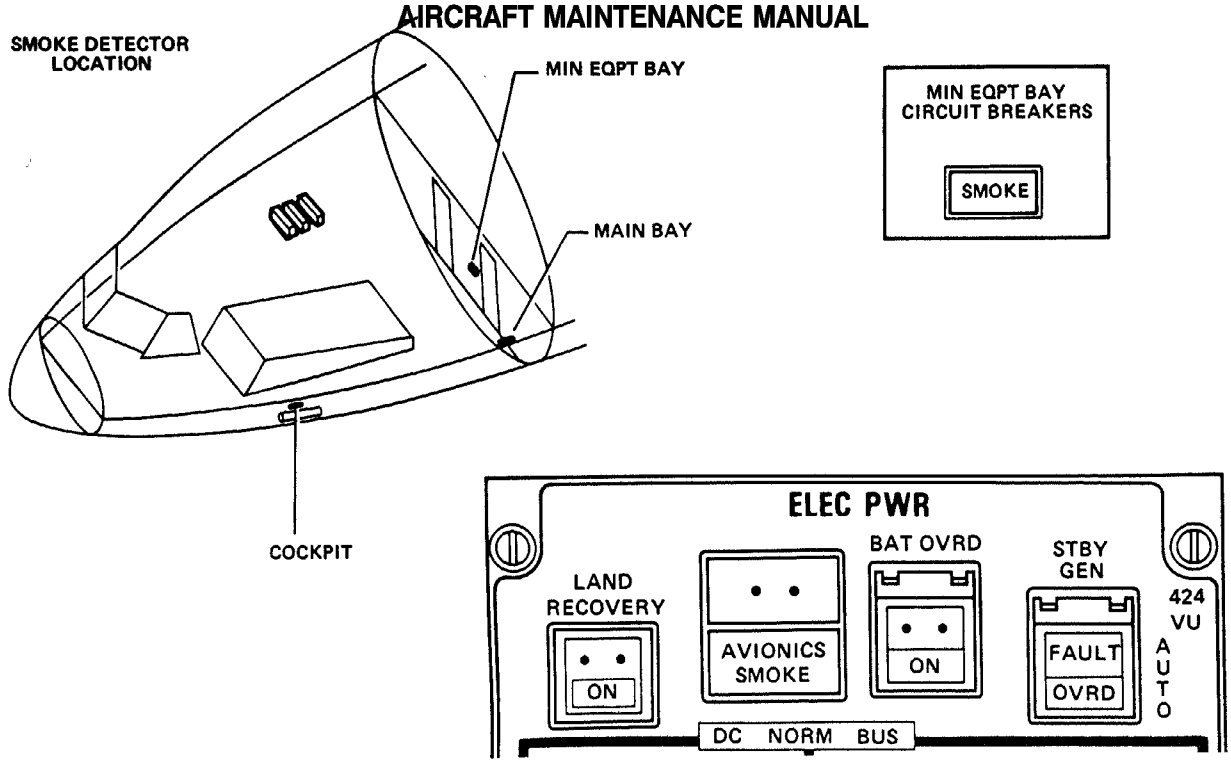
(2)The cargo compartment sub-system comprises ambient smoke detectors located in the ceiling of the cargo compartments.
When the threshold of the smoke detectors is exceeded the cargo smoke detection unit triggers the smoke warnings and closes cargo compartment heating and ventilation (if installed).

R **ON A/C 101-200,

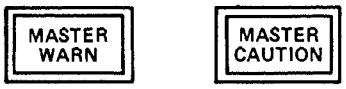
(Ref. Fig. 006)

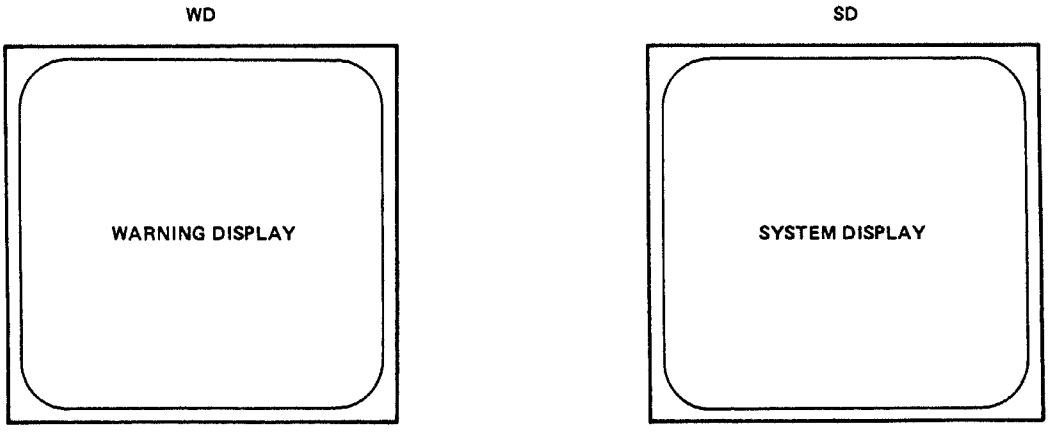
R **ON A/C 001-100,

(Ref. Fig. 007)




PANEL 3VU (5VU)

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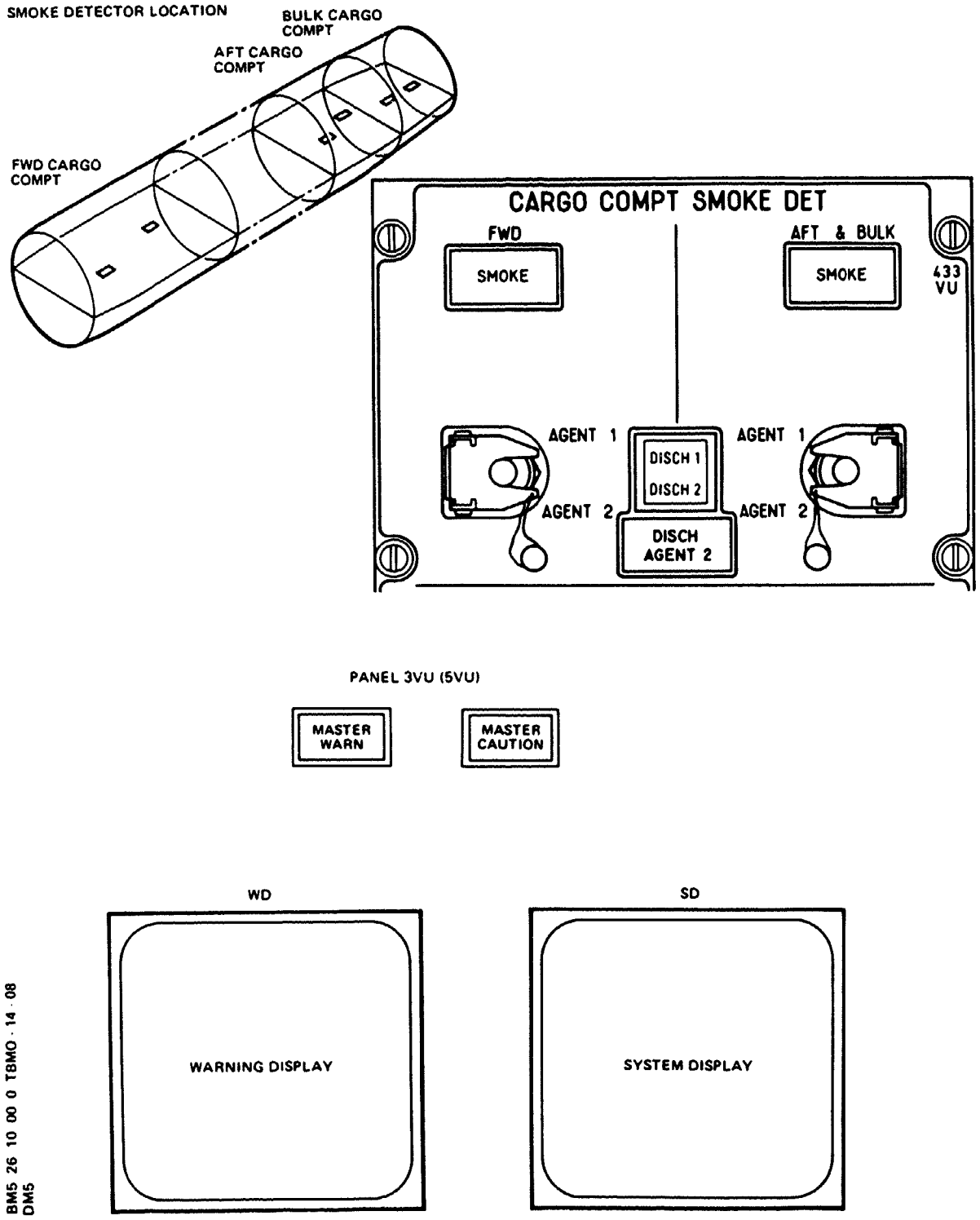
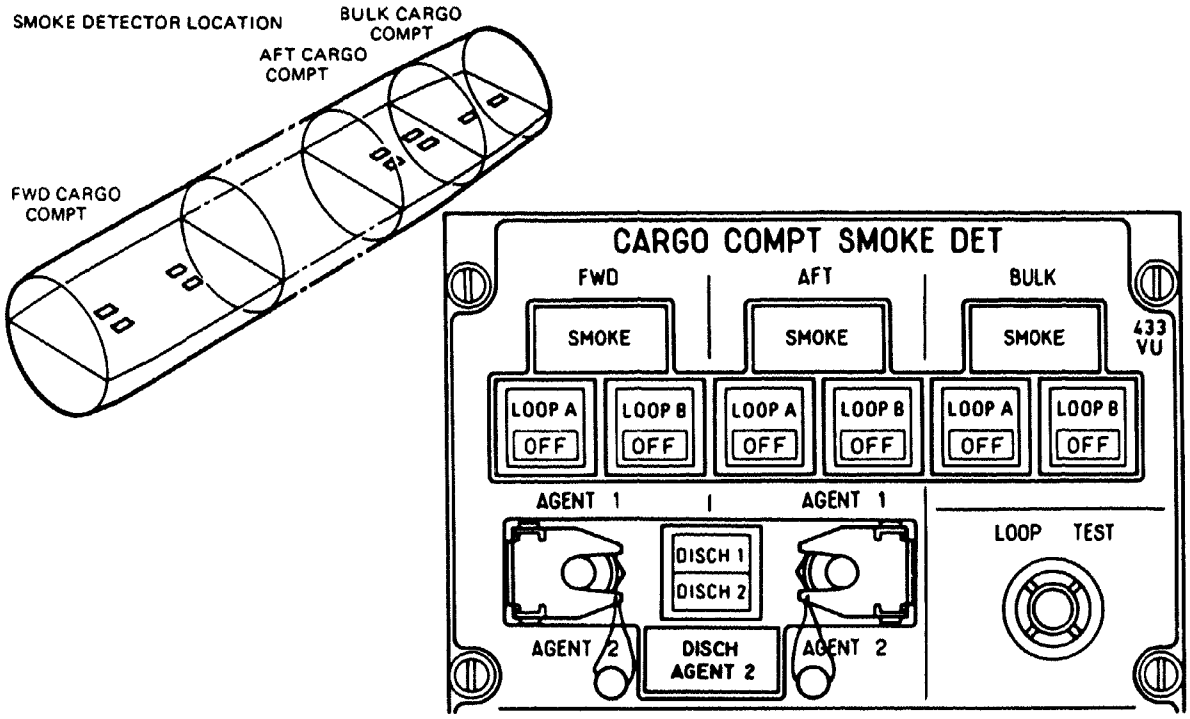
Component Location - Avionics Compartment
Smoke Detection
Figure 001




Component Location - Cargo Compartment Smoke Detection
Figure 002

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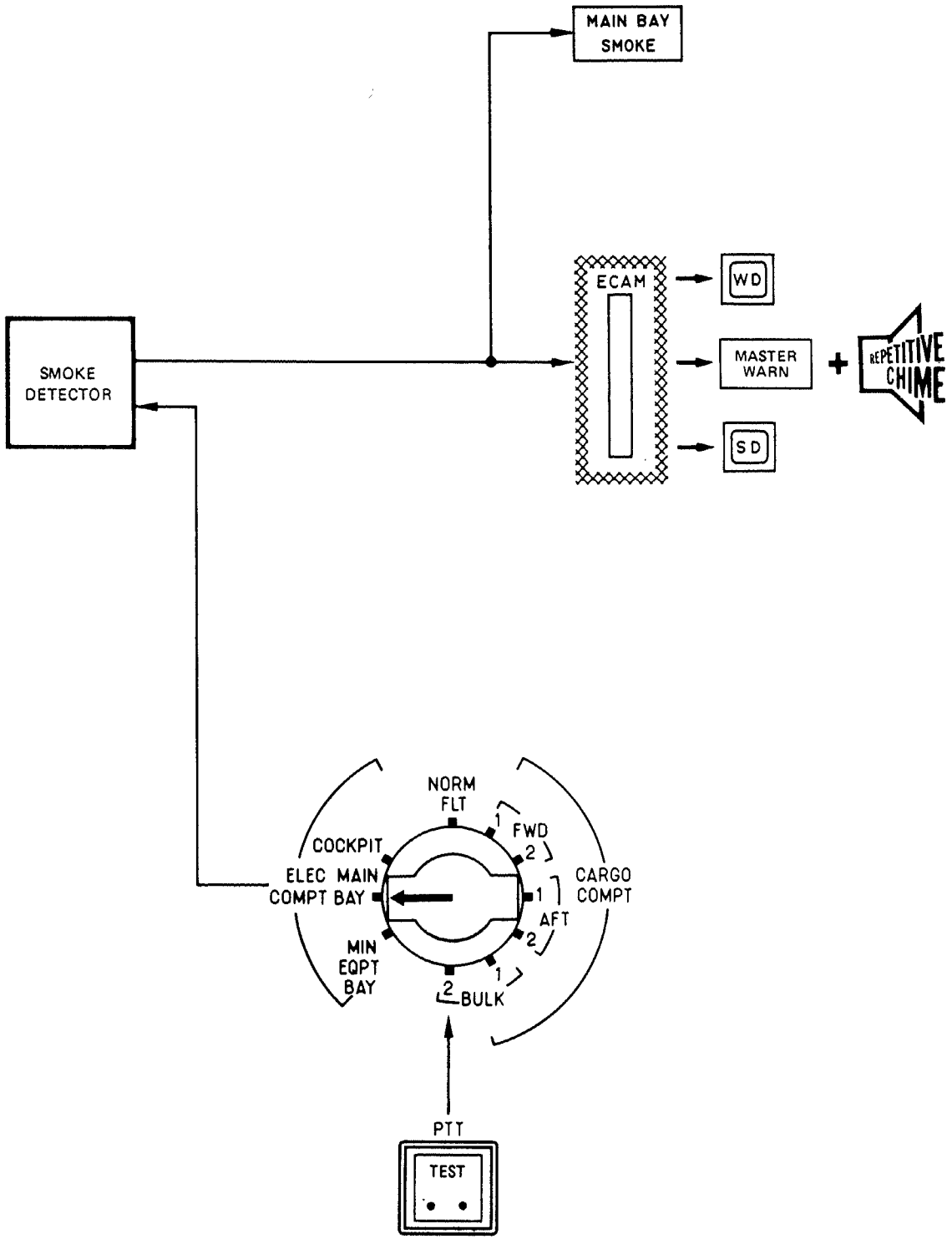
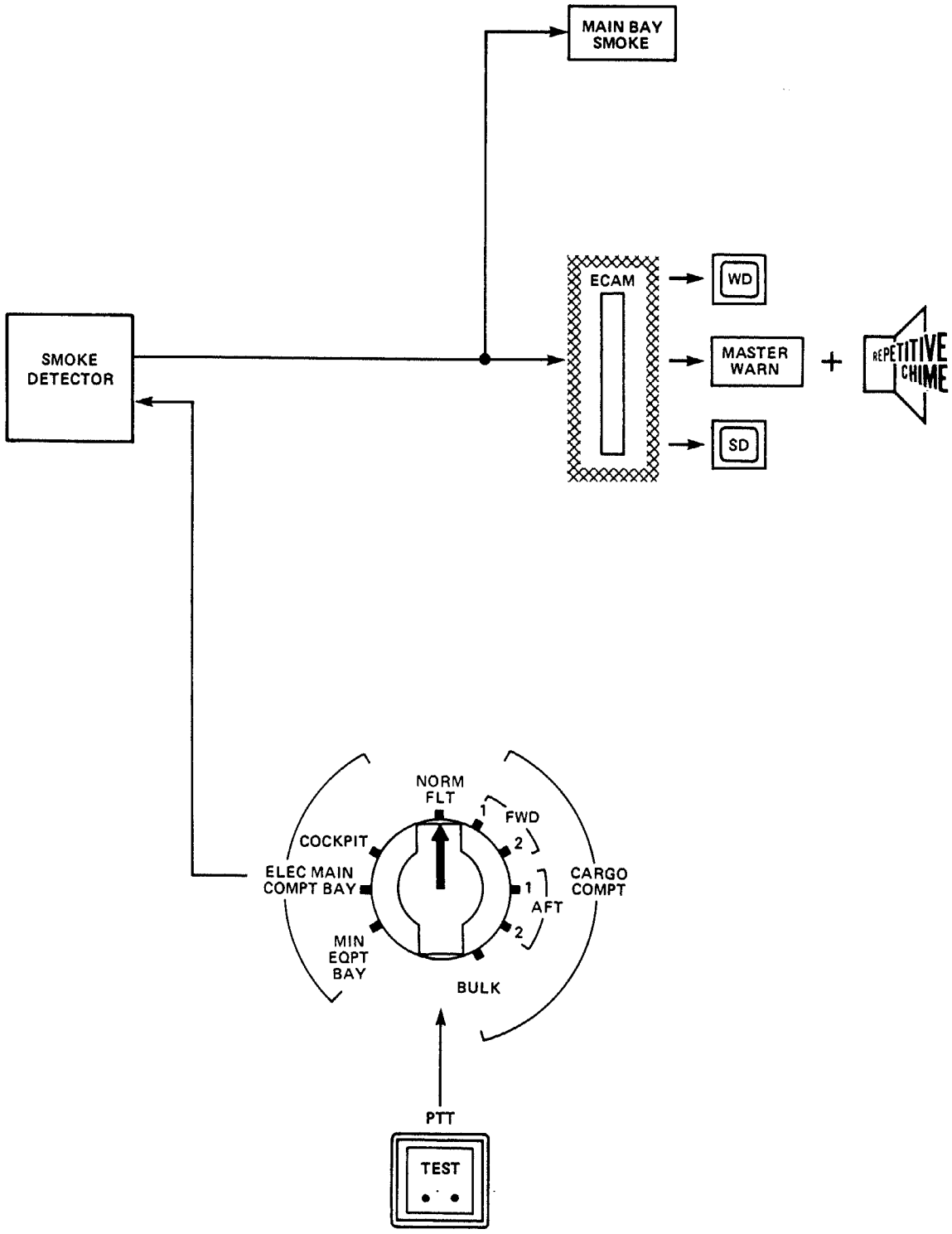
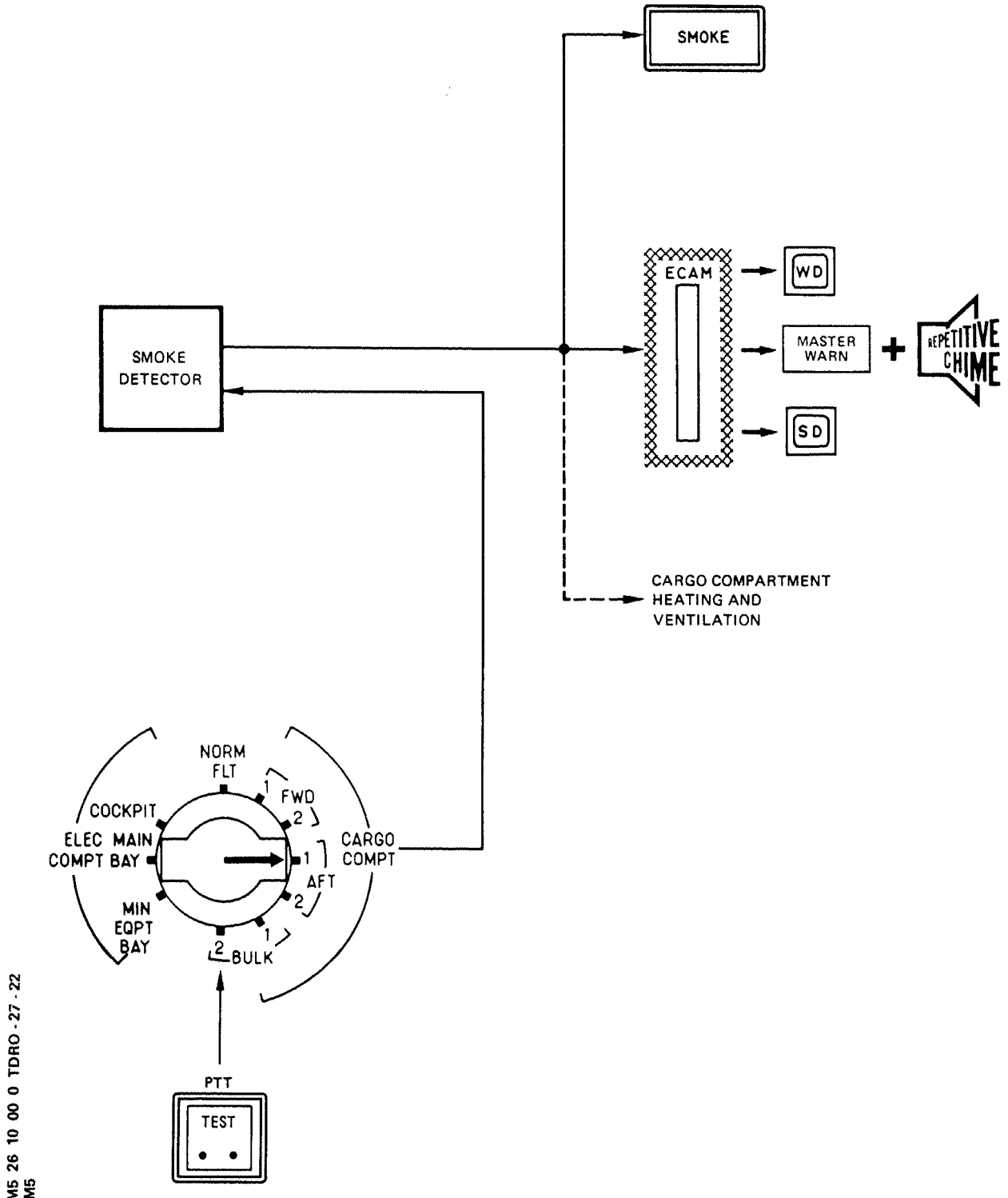
Component Location - Cargo Compartment Smoke Detection
Figure 003



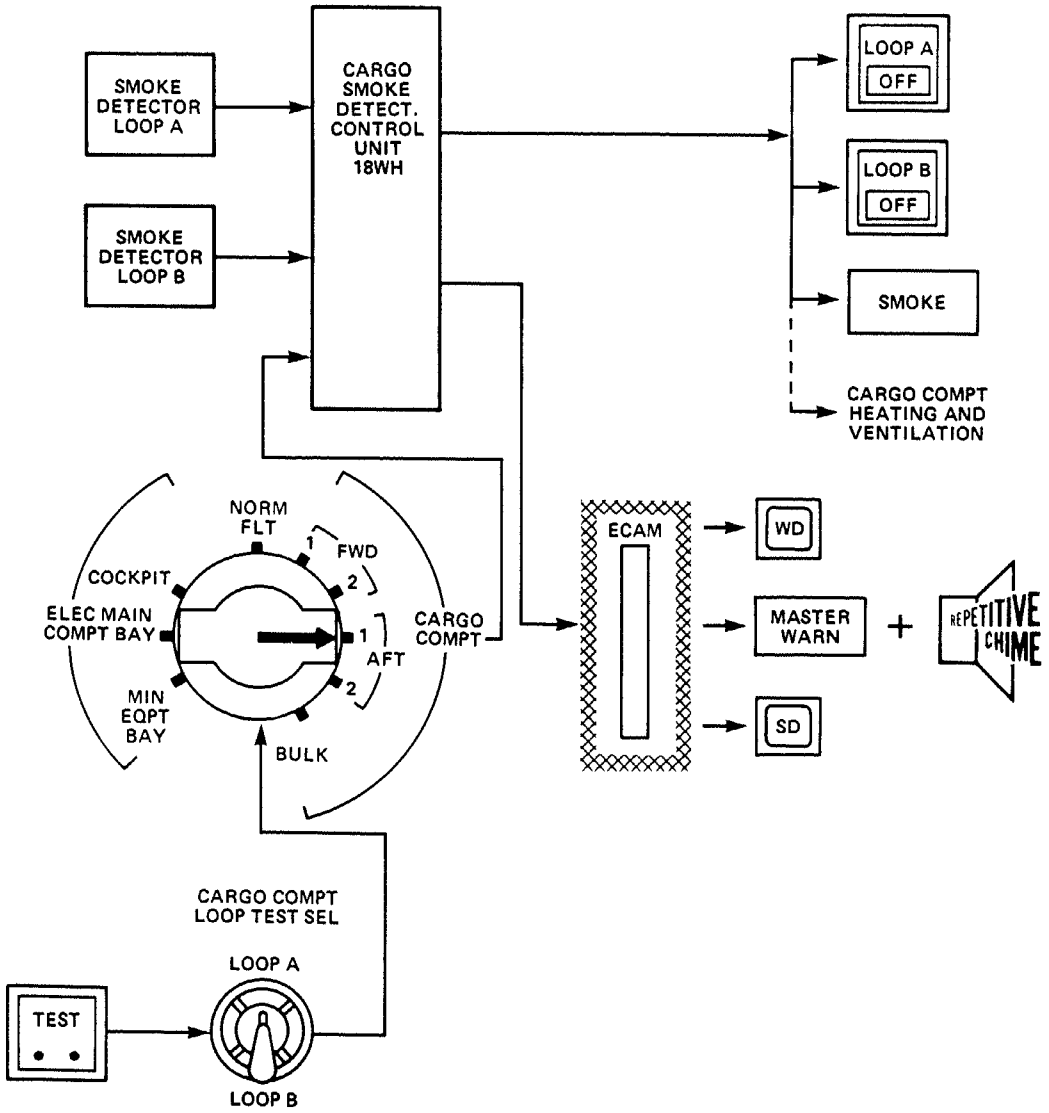

Avionics Compartment Smoke Detection - Schematic
Figure 004




Avionics Compartment Smoke Detection - Schematic
Figure 005




Cargo Compartment Smoke Detection - Schematic
Figure 006

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Cargo Compartment Smoke Detection - Schematic
Figure 007

R **ON A/C 101-200,

(3)Each smoke detector circuit can be tested individually by use of a PTT pushbutton switch and a selector switch.

R **ON A/C 001-100,

(3)Each smoke detector circuit can be tested individually by use of a PTT pushbutton switch and a selector switch.
For the cargo compartment an additional switch enables the separate loops to be selected.
(Ref. Fig. 008)

R **ON A/C ALL

2. Fire Detection

A. Principle of Fire Detection Operation

R **ON A/C 001-100,

(Ref. Fig. 009)

R **ON A/C 101-200,

(Ref. Fig. 010)

R **ON A/C ALL

These sub-systems indicate the presence of fire or of overheating in the nacelles.
The engine fire detection system consists in :
- two identical but independent loops (A and B) which have the same routing in the nacelle. Each loop comprises three fire sensing elements located in the engine pylon fire barrier, and on engine.
- an indicating assembly comprising a fire detection control unit which processes signals issued from loops and transmits the fire warning to the indicating system
- a control assembly located in the flight compartment enabling operation of one loop only or system testing.

(Ref. Fig. 011)
(Ref. Fig. 012)

3. Overheat Detection
Refer to Chapter 36.

4. Smoke and Fire Detection Electrical Supply

INTENTIONALLY BLANK

| LOOP LIGHT CONFIGURATION / ASSOCIATED WARNING | LOOP A OFF, LOOP B OFF | LOOP A OFF, LOOP B OFF | LOOP A OFF, LOOP B OFF | LOOP A OFF, LOOP B | LOOP A, LOOP B OFF |
|---|---|---|---|---|---|
| LOCAL WARNING | SMOKE | SMOKE | SMOKE | | |
| MASTER WARNING | MASTER WARN | MASTER WARN | MASTER WARN | MASTER CAUTION | MASTER CAUTION |
| AUDIO ALARM | REPETITIVE CHIME | REPETITIVE CHIME | REPITITIVE CHIME | SINGLE STROKE CHIME | SINGLE STROKE CHIME |
| SYSTEM DISPLAY | AIR CONDITIONING SYNOPTIC (BULK CARGO) | AIR CONDITIONING SYNOPTIC (BULK CARGO) | AIR CONDITIONING SYNOPTIC (BULK CARGO) | | |
| WARNING DISPLAY | SMOKE<br>FWD COMPT SMOKE<br>(OR AFT,BULK)<br>- 1 st AGENT ... DISCH<br>- LDG AIRFIELD ... 9000FT<br>- MAX FL ... 90/MSA | SMOKE<br>FWD COMPT SMOKE<br>(OR AFT,BULK)<br>- 1 st AGENT ... DISCH<br>- LDG AIRFIELD .... 9000FT<br>- MAX FL ..... 90/MSA | SMOKE<br>FWD COMPT SMOKE<br>(OR AFT,BULK)<br>- 1 st AGENT ... DISCH<br>- LDG AIRFIELD ... 9000FT<br>- MAX FL ... 90/MSA | LOOP<br>FWD COMPT LOOP A ONLY<br>(OR AFT,BULK)<br>LOOP TEST ... PERFORM | LOOP<br>FWD COMPT LOOP B ONLY<br>(OR AFT,BULK)<br>LOOP TEST ... PERFORM |
| | CLOSURE OF TRIM AIR AND ISOLATION VALVES (BULK CARGO) | CLOSURE OF TRIM AIR AND ISOLATION VALVES (BULK CARGO) | CLOSURE OF TRIM AIR AND ISOLATION VALVES (BULK CARGO) | | |
| | | | | | |

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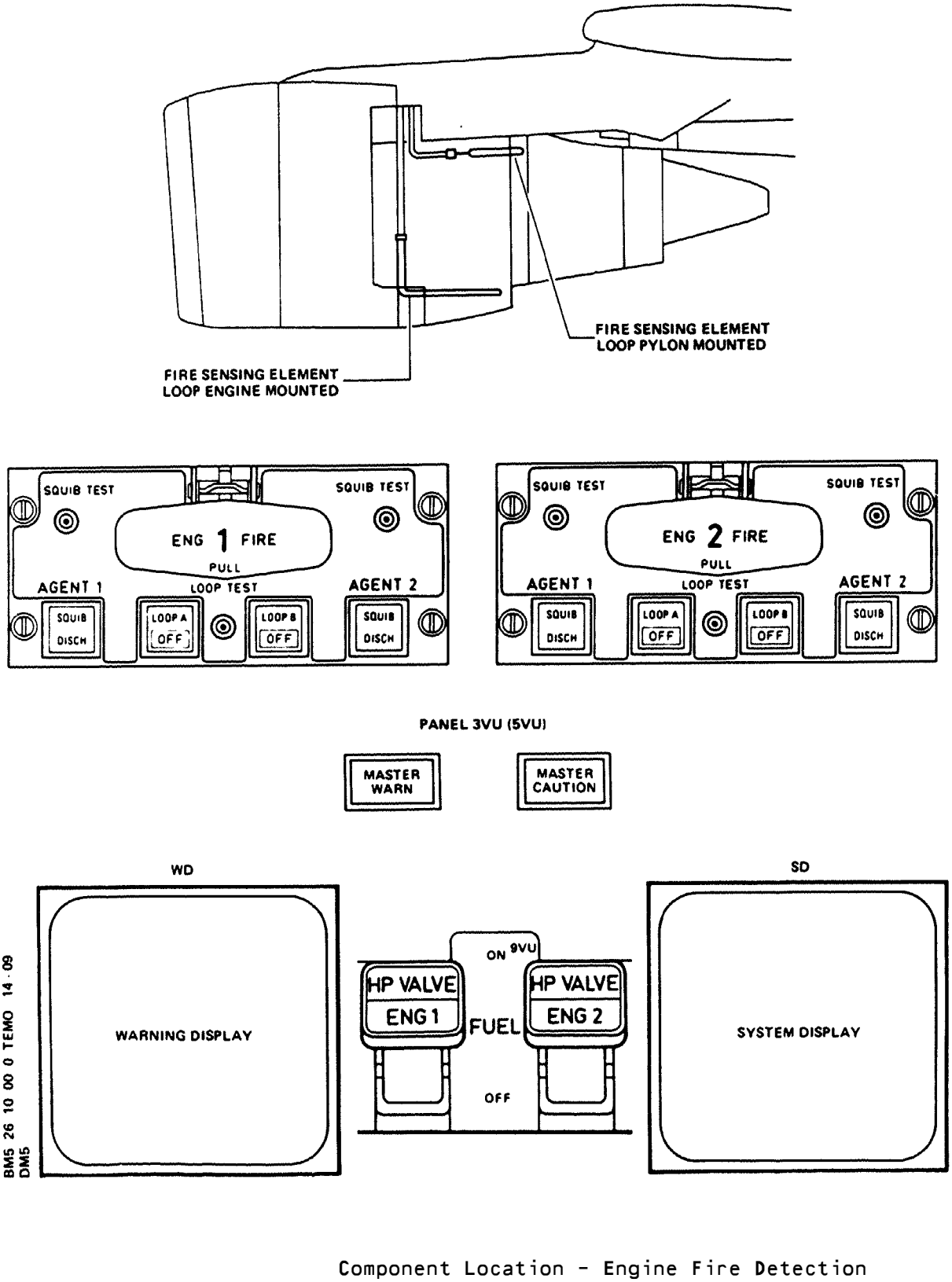
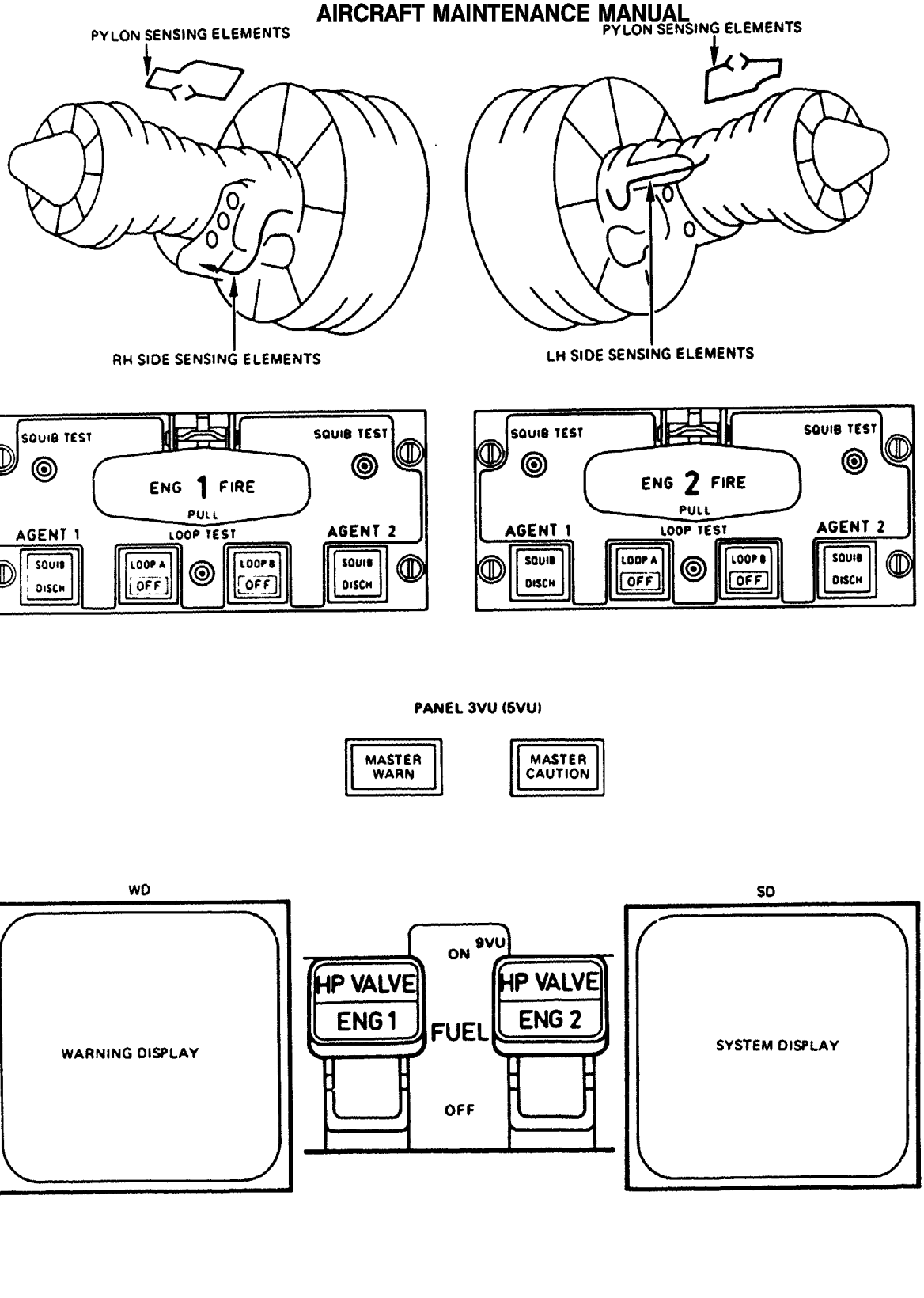
Cargo Compartment Smoke Detection - Warnings
Figure 008




Component Location - Engine Fire Detection
Figure 009




Component Location - Engine Fire Detection
Figure 010

| LOOP LIGHT CONFIGURATION / ASSOCIATED WARNINGS | LOOP TEST<br>LOOP A OFF<br>LOOP B OFF | LOOP TEST<br>LOOP A OFF<br>LOOP B OFF | LOOP TEST<br>LOOP A OFF<br>LOOP B OFF | LOOP TEST<br>LOOP A OFF<br>LOOP B OFF | LOOP TEST<br>LOOP A OFF<br>LOOP B OFF |
|---|---|---|---|---|---|
| LOCAL WARNINGS | ENG FIRE<br>PULL | ENG FIRE<br>PULL | ENG FIRE<br>PULL | | |
| | HP VALVE<br>ENG | HP VALVE<br>ENG | HP VALVE<br>ENG | | |
| MASTER WARNING | MASTER WARN | MASTER WARN | MASTER WARN | MASTER CAUTION | MASTER CAUTION |
| AUDIO WARNING | CONTINUOUS REPETITIVE CHIME | CONTINUOUS REPETITIVE CHIME | CONTINUOUS REPETITIVE CHIME | SINGLE STROKE CHIME | SINGLE STROKE CHIME |
| WARNING DISPLAY | ENG FIRE<br>THR IDLE<br>HP FUEL (CONTROL) LEVER OFF<br>FIRE HANDLE PULL<br>1ST AGENT AFT 10s DISCH<br><br>IF FIRE AFT 30s<br>2ND AGENT DISCH<br>LAND ASAP | ENG FIRE<br>THR IDLE<br>HP FUEL (CONTROL) LEVER OFF<br>FIRE HANDLE PULL<br>1ST AGENT AFT 10s DISCH<br><br>IF FIRE AFT 30s<br>2ND AGENT DISCH<br>LAND ASAP | ENG FIRE<br>THR IDLE<br>HP FUEL (CONTROL) LEVER OFF<br>FIRE HANDLE PULL<br>1ST AGENT AFT 10s DISCH<br><br>IF FIRE AFT 30s<br>2ND AGENT DISCH<br>LAND ASAP | LOOP<br><br>ENG LOOP A<br>FAULT...OFF | LOOP<br><br>ENG LOOP B<br>FAULT...OFF |
| | | | | | |

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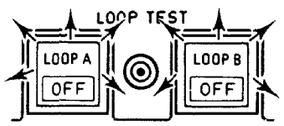
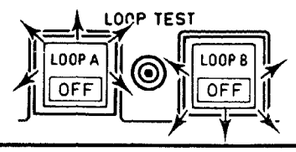
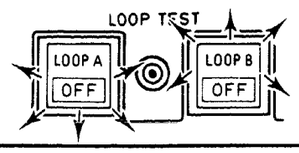
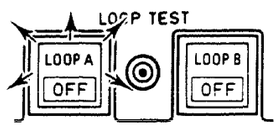
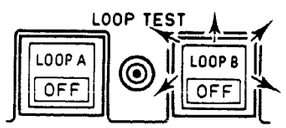
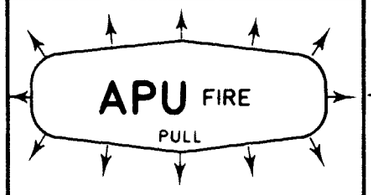
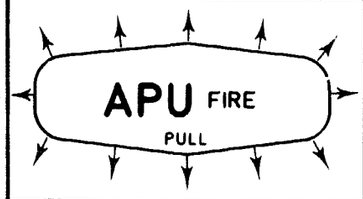
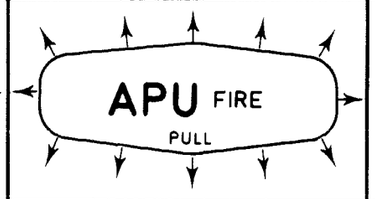
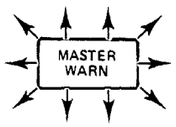
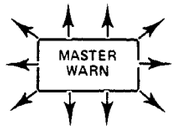
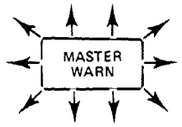
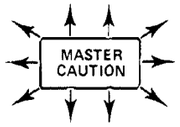
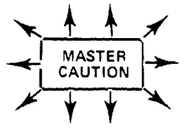
Engine Fire Detection - Warning
Figure 011

| LOOP LIGHT CONFIGURATION / ASSOCIATED WARNINGS |  |  |  |  |  |
|---|---|---|---|---|---|
| LOCAL WARNINGS |  |  |  | | |
| MASTER WARNING |  |  |  |  |  |
| AUDIO WARNING | CONTINUOUS REPETITIVE CHIME | CONTINUOUS REPETITIVE CHIME | CONTINUOUS REPETITIVE CHIME | SINGLE STROKE CHIME | SINGLE STROKE CHIME |
| WARNING DISPLAY | APU FIRE<br>FIRE HANDLE PULL<br>AGENT AFTER 10 s DISCH<br>MASTER SWITCH OFF<br>IF FIRE WARNING PERSISTS<br>LAND ASAP | APU FIRE<br>FIRE HANDLE PULL<br>AGENT AFTER 10 s DISCH<br>MASTER SWITCH OFF<br>IF FIRE WARNING PERSISTS<br>LAND ASAP | APU FIRE<br>FIRE HANDLE PULL<br>AGENT AFTER 10 s DISCH<br>MASTER SWITCH OFF<br>IF FIRE WARNING PERSISTS<br>LAND ASAP | LOOP<br>APU LOOP A<br>FAULT ... OFF | LOOP<br>APU LOOP B<br>FAULT ... OFF |
| EXTERNAL WARNINGS (A/C ON GROUND) | + EXTERNAL HORN | + EXTERNAL HORN | + EXTERNAL HORN | | |
| | | | | | |

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DM5

APU Fire Detection - Warning
Figure 012

R **ON A/C 101-200,

(Ref. Fig. 013)

R **ON A/C 001-100,

(Ref. Fig. 014)

R **ON A/C ALL

All smoke and fire detection systems are supplied from the DC essential busbar 3PP.

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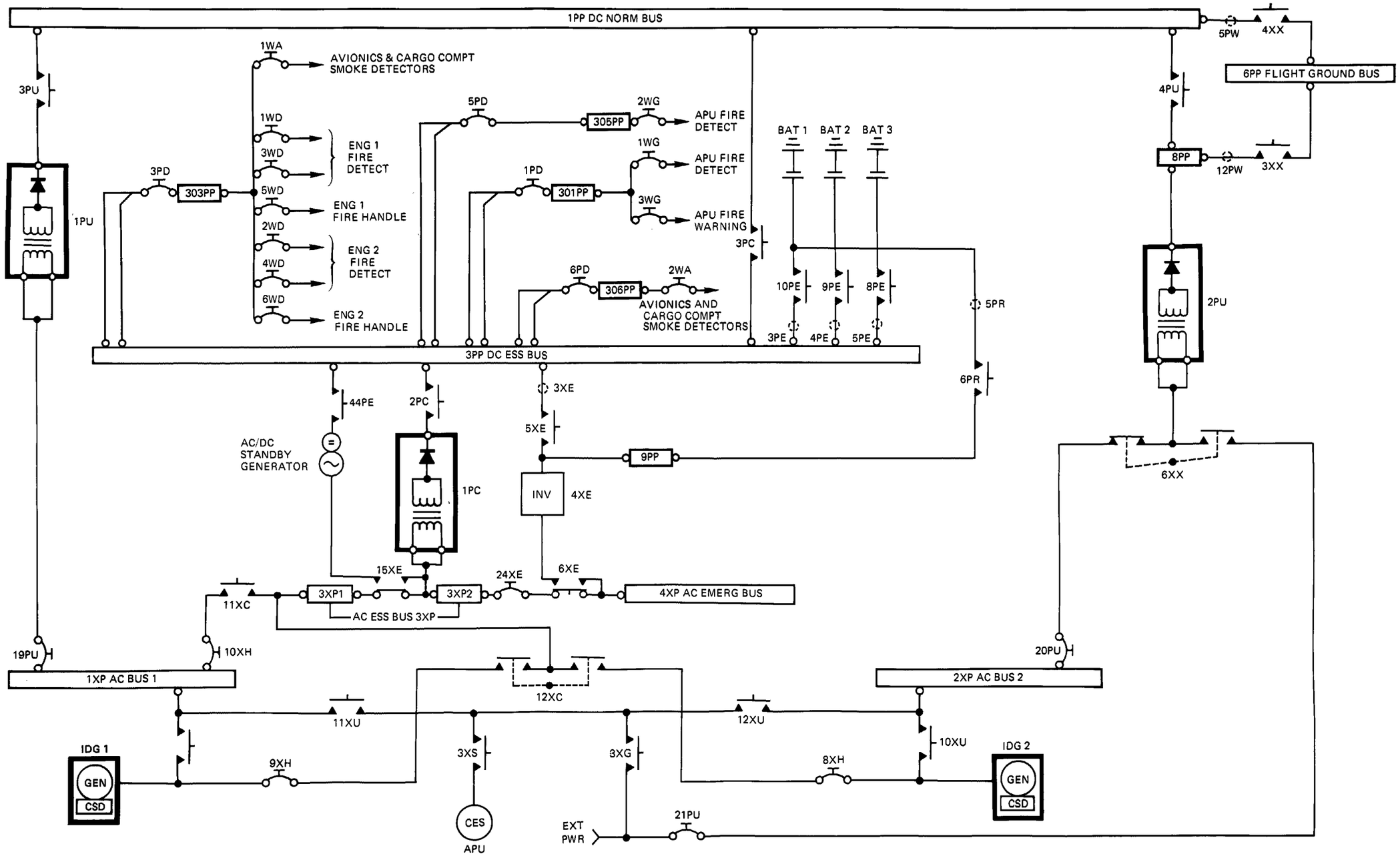


BM5 26 10 00 0 CHMO-17-13
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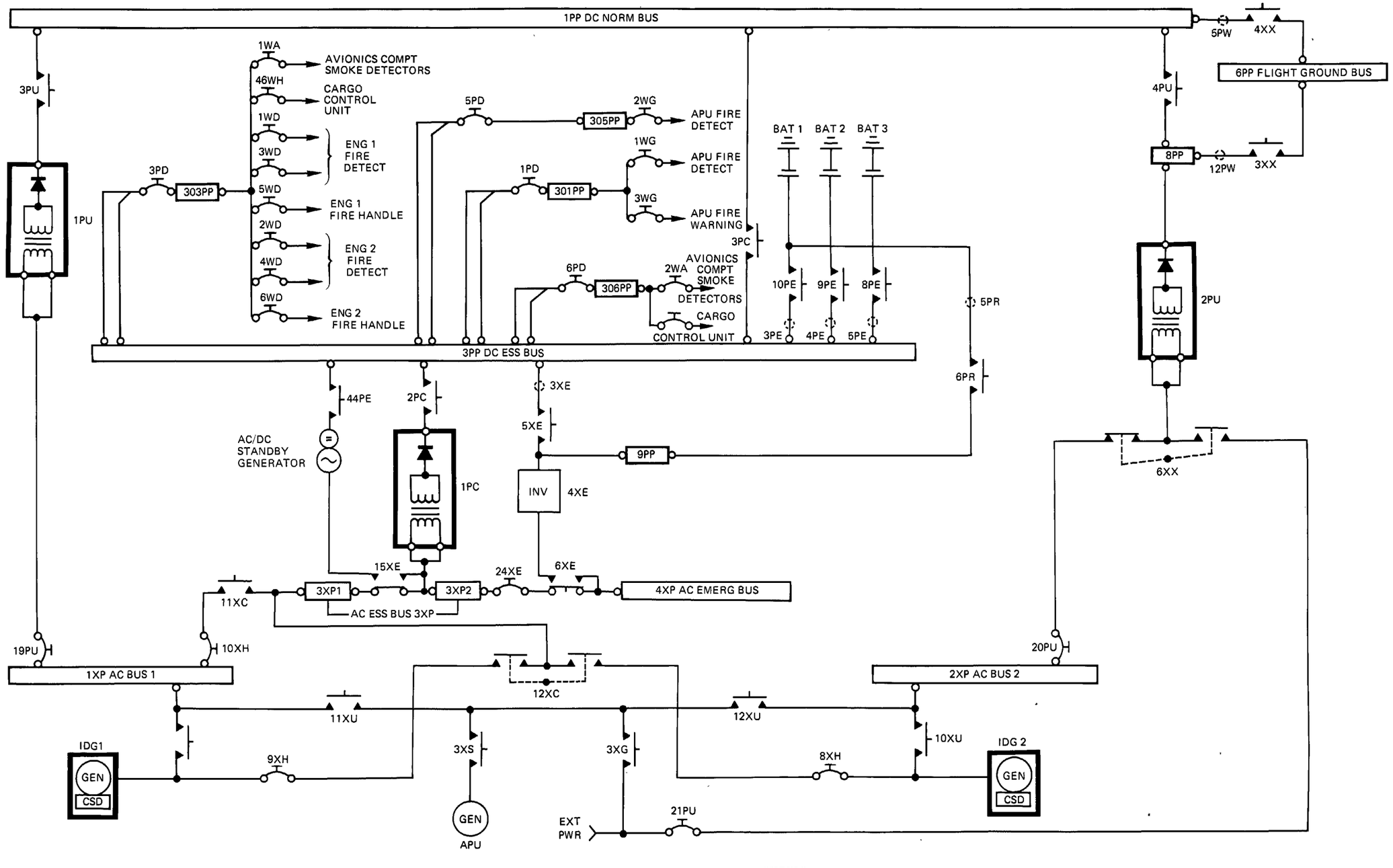
Smoke and Fire Detection Electrical Supply
Figure 013




BM5 26 10 00 0 CJMO - 17

Smoke and Fire Detection Electrical Supply
Figure 014

## ENGINE FIRE AND OVERHEAT DETECTION - DESCRIPTION AND OPERATION

### 1. General

The engine fire detection system consists in two continuous loops connected in parallel and connected to a fire detection control unit according to an **AND** logic. A self monitoring device for the fire sensing elements enables any detection loop loss to be indicated to the crew members.
For one engine each loop comprises :
(Ref. Fig. 003, 004)

- two fire sensing element assemblies connected in parallel and installed in the left and right sides of the engine core and above the combustion chamber.
- one fire detection control unit installed in electronics rack 90VU, shelf 96VU (Ref. Fig. 001)
- one control and indicating assembly located in the flight compartment overhead panel

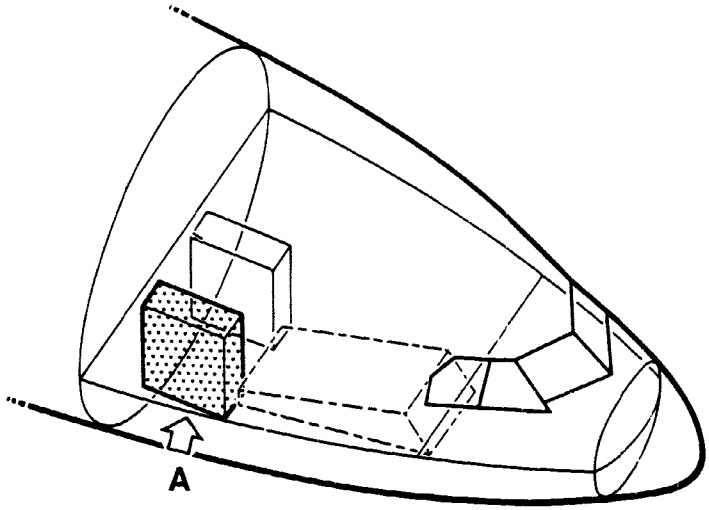
### 2. Component Location

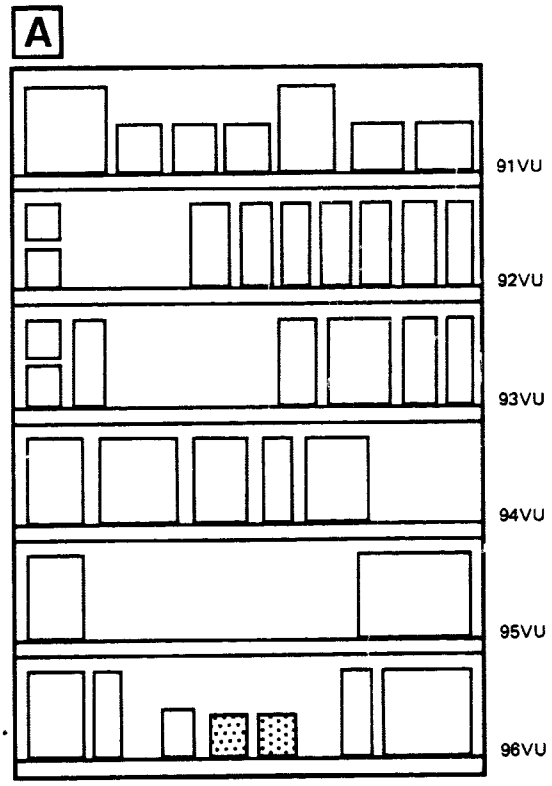
(Ref. Fig. 001)
(Ref. Fig. 002)

| | FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|---|
| | 11WD | CTL UNIT-FIRE DET, ENG1 | 96VU | 122 | 132AZ | 26-12-11 |
| | 12WD | CTL UNIT-FIRE DET, ENG2 | 96VU | 122 | 132AZ | 26-12-11 |
| | 39WD | HANDLE-ENG1 FIRE | 20VU | 211 | | 26-12-20 |
| | 40WD | HANDLE-ENG2 FIRE | 20VU | 211 | | 26-12-20 |
| R | 22WD | SENSING ELEMENT FIRE 2/ | | 440/ | 445AL/ | 26-12-12 |
| R | | LOOP A | | 460 | 461AL | |
| | | | | | 446AR/ | |
| | | | | | 462AR | |
| R | 23WD | SENSING ELEMENT FIRE 1/ | | 430/ | 435AL/ | 26-12-12 |
| R | | LOOP A | | 450 | 451AL | |
| | | | | | 436AR/ | |
| | | | | | 452AR | |
| R | 26WD | SENSING ELEMENT FIRE 2/ | | 440/ | 445AL/ | 26-12-12 |
| R | | LOOP B | | 460 | 461AL | |
| | | | | | 446AR/ | |
| | | | | | 462AR | |
| R | 27WD | SENSING ELEMENT FIRE 1/ | | 430/ | 435AL/ | 26-12-12 |
| R | | LOOP B | | 450 | 451AL | |
| | | | | | 436AR/ | |
| | | | | | 452AR | |
| R | H1 | SENSING ELEMENT ENG 1(2)/CORE/ | | 430/ | 435AL/ | 26-12-12 |
| R | | LOOP A, L | | 450 | 451AL | |
| R | | | | 440/ | 445AL/ | |
| R | | | | 460 | 461AL | |
| R | H2 | SENSING ELEMENT ENG 1(2)/CORE/ | | 430/ | 435AL/ | 26-12-12 |
| R | | LOOP B, L | | 450 | 451AL | |
| | | | | 440/ | 445AL/ | |
| | | | | 460 | 461AL | |

| | FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|---|
| R | H3 | SENSING ELEMENT ENG 1(2)/CORE/ | | 430/ | 436AR/ | 26-12-12 |
| R | | LOOP A, R | | 450 | 452AR | |
| | | | | 440/ | 446AR/ | |
| | | | | 460 | 462AR | |
| R | H4 | SENSING ELEMENT ENG 1(2)/CORE/ | | 430/ | 436AR/ | 26-12-12 |
| R | | LOOP B, R | | 450 | 452AR | |
| R | | | | 440/ | 446AR/ | |
| R | | | | 460/ | 462AR | |

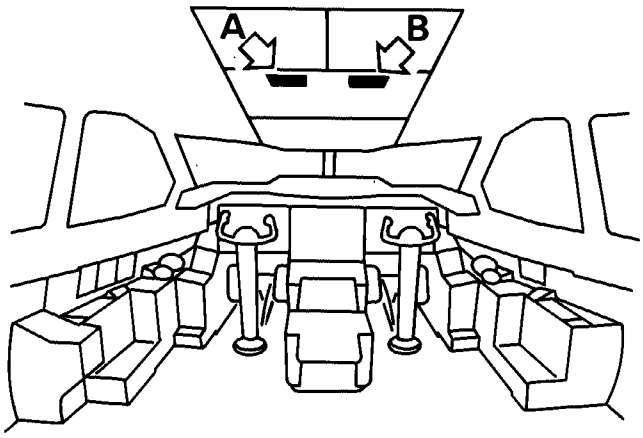
(Ref. Fig. 003)

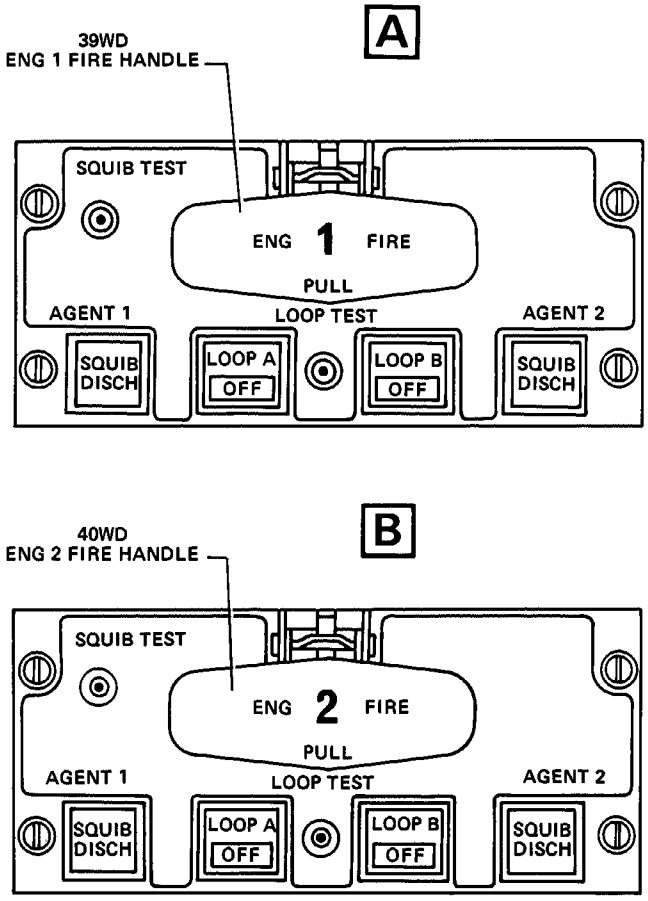



BMS 26 12 00 0 GRCO

Component Location Fire Detection Control Unit
Figure 001




BM5 26 12 00 0 TSMO - 13 - 08
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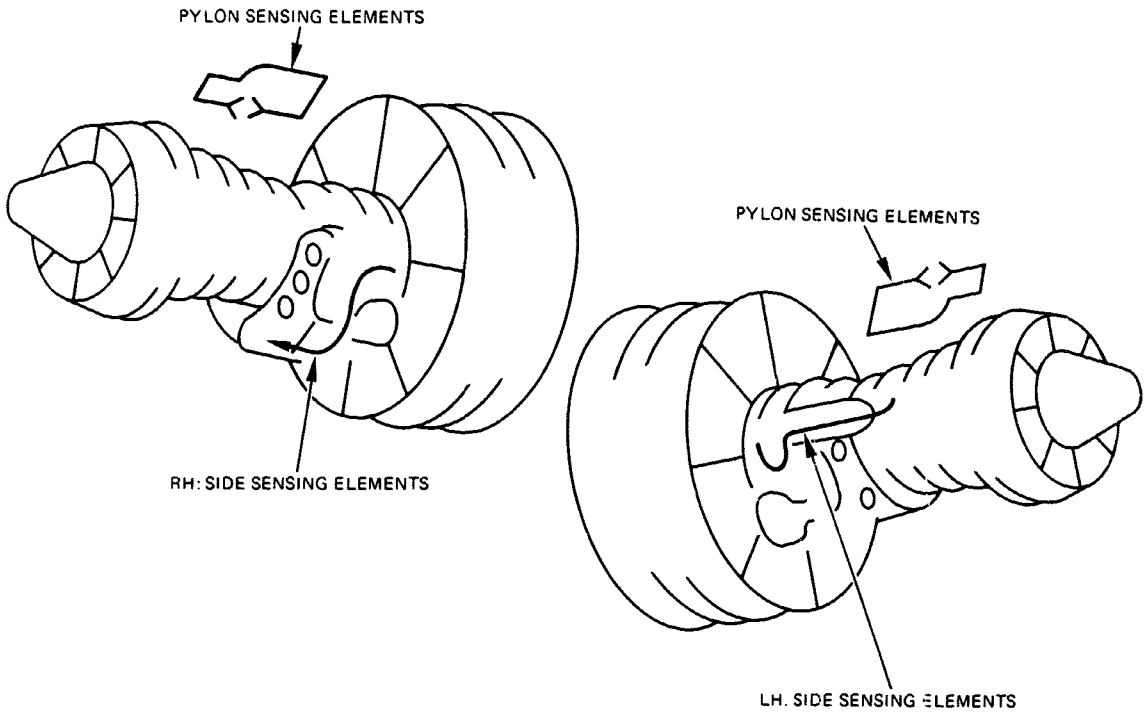
Control and Indicating - Component Location
Figure 002




BM5 26 12 00 0 PAMO

Component Location - Fire Sensing Elements
Figure 003

3. Description
(Ref. Fig. 004)

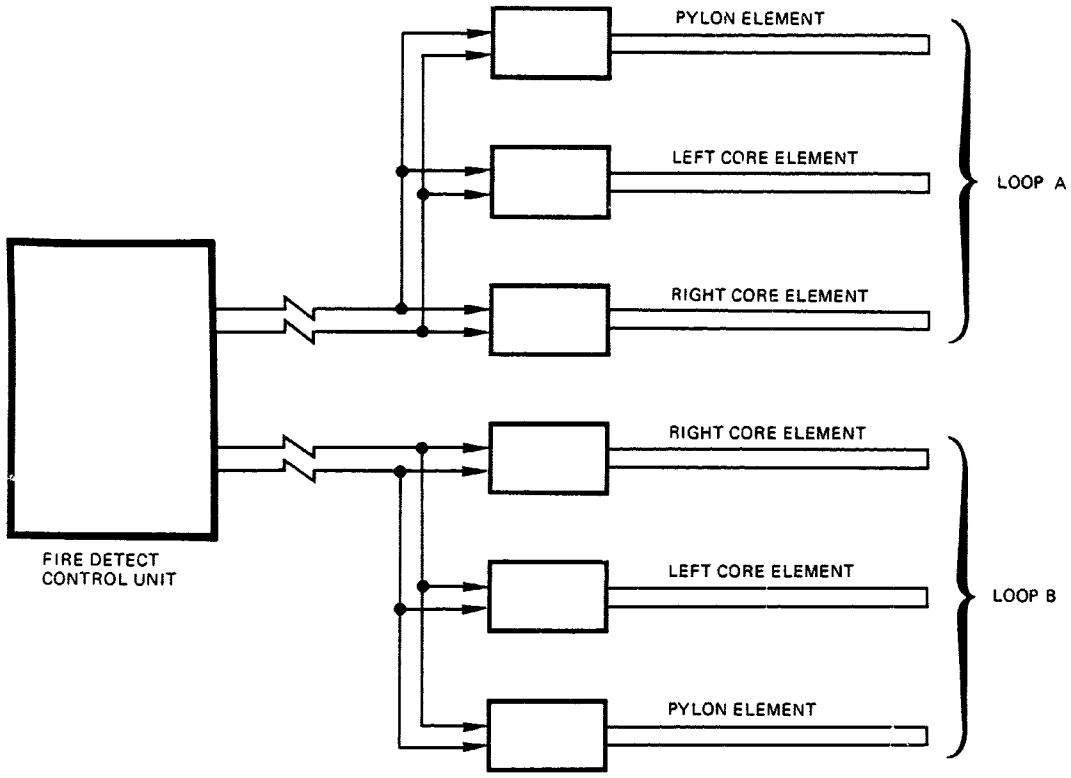
A. Fire Sensing Element (Ref. Fig. 005)
The fire sensing element consists in a stainless steel tube, the outer diameter of which is 0.063 in. (1.6 mm) and thickness 0.018 in. (0.46 mm).
Inside this tube is routed a titanium tube containing hydrogen. This central core is inserted into a spiral made up of an inert material having the special property of giving off and absorbing a gas.
The gap comprised between the core and the sensing element outer tube wall is fitted with helium at an initial pressure of 2 to 3 bars depending on the setting temperature selected for each sensing element.
The sensing element reacts according to the ideal gas law.
One end of the sensing element is hermetically soldered and the other one is connected to a one inch (25.4 mm) dia. stainless steel body called responder.
The responder contains a chamber connected to two pressure switches : a warning switch and an integrity switch.
The free end of the responder is connected to the aircraft circuit electrical harness.

B. Fire Detection Control Unit
(Ref. Fig. 006)
The fire detection control unit processes warning signals proceeding from the responders according to an **AND** logic and triggers the corresponding warnings in the flight compartment (**FIRE** warning circuit).
Moreover, a **FAULT** circuit for each loop, separated from the **FIRE** warning circuit enables the crew members to be aware of any fire sensing element faulty operation such as sensing element leakage, loss of an electrical signal from the responder.

C. Control and Indicating Assembly
(Ref. Fig. 007)
(Ref. Fig. 008)
The control and indicating assembly is located on the overhead panel and is comprised for each engine of :
- two mechanically latched **LOOP TEST/LOOP A** and **LOOP TEST/LOOP B** pushbutton switches, with amber and white integral lights
- one **LOOP TEST** pushbutton switch
- one **ENG 1(2) FIRE** handle with integral red warning light
- on **CAPT** and **F/O** main instrument panels **3VU** and **5VU**
  . one **MASTER WARN** light
  . one **MASTER** caution light
  **NOTE** : The **LH ECAM** display unit enables checking of the fire detection loop integrity in the various indicating configurations.

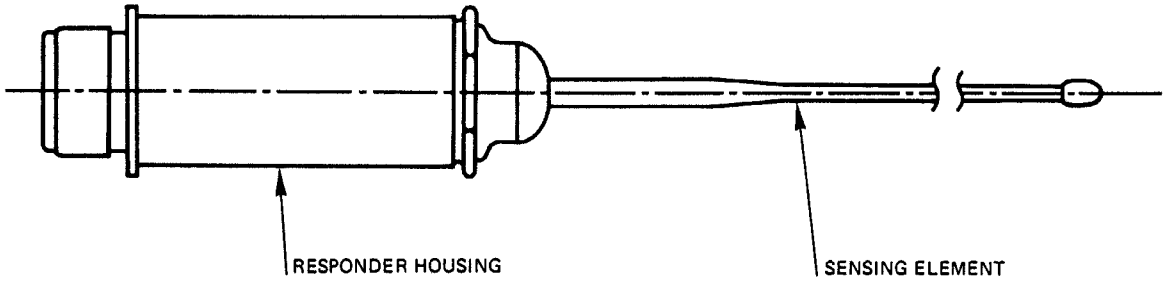
4. Operation

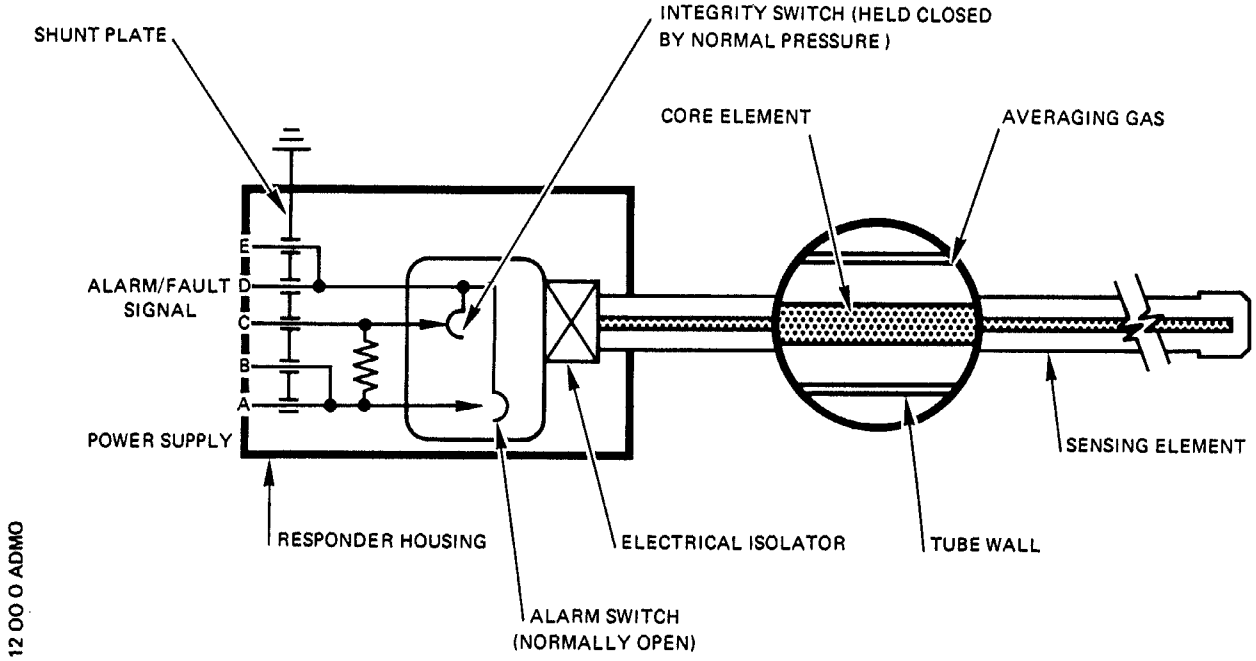
A. Fire Sensing Element (Ref. Fig. 009)
(1)When the sensing element is submitted to an increase in temperature over a certain length, the internal pressure of the helium increases in pro-



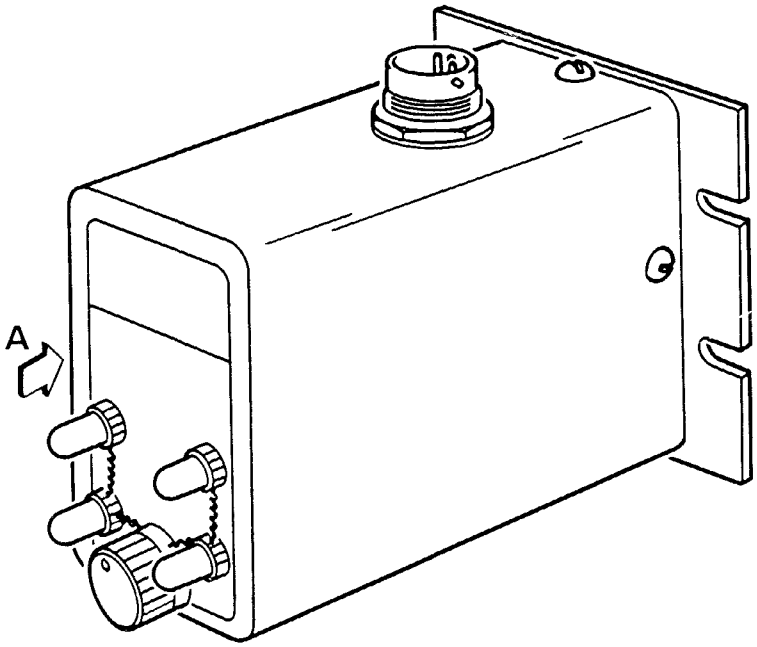

BM5 26 12 00 0 BCMO

Engine Fire Detection - Schematic
Figure 004




Fire Sensing Element - Schematic
Figure 005

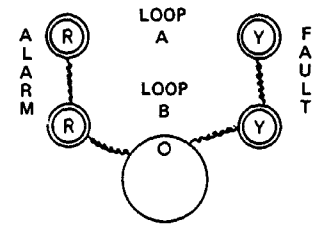



A

TEST INSTRUCTIONS

1 - IF LAMP ON BEFORE TEST
TURN SWITCH TO OPPOSITE SIDE
A - TESTED SIDE LAMPS "ON"
PLUS LAMP PREVIOUSLY "ON"
EXTING = BOX GOOD
B - OTHER INDICATION = BOX FAULTY

2 - IF LAMP OFF BEFORE TEST :
TURN SWITCH TO EACH SIDE
A - ONLY TESTED SIDE LAMPS
"ON" = BOX GOOD
B - OTHER INDICATION = BOX FAULTY




BM5 26 12 00 0 AENO - 10 - 05
DM5

Fire Detection Control Unit
Figure 006

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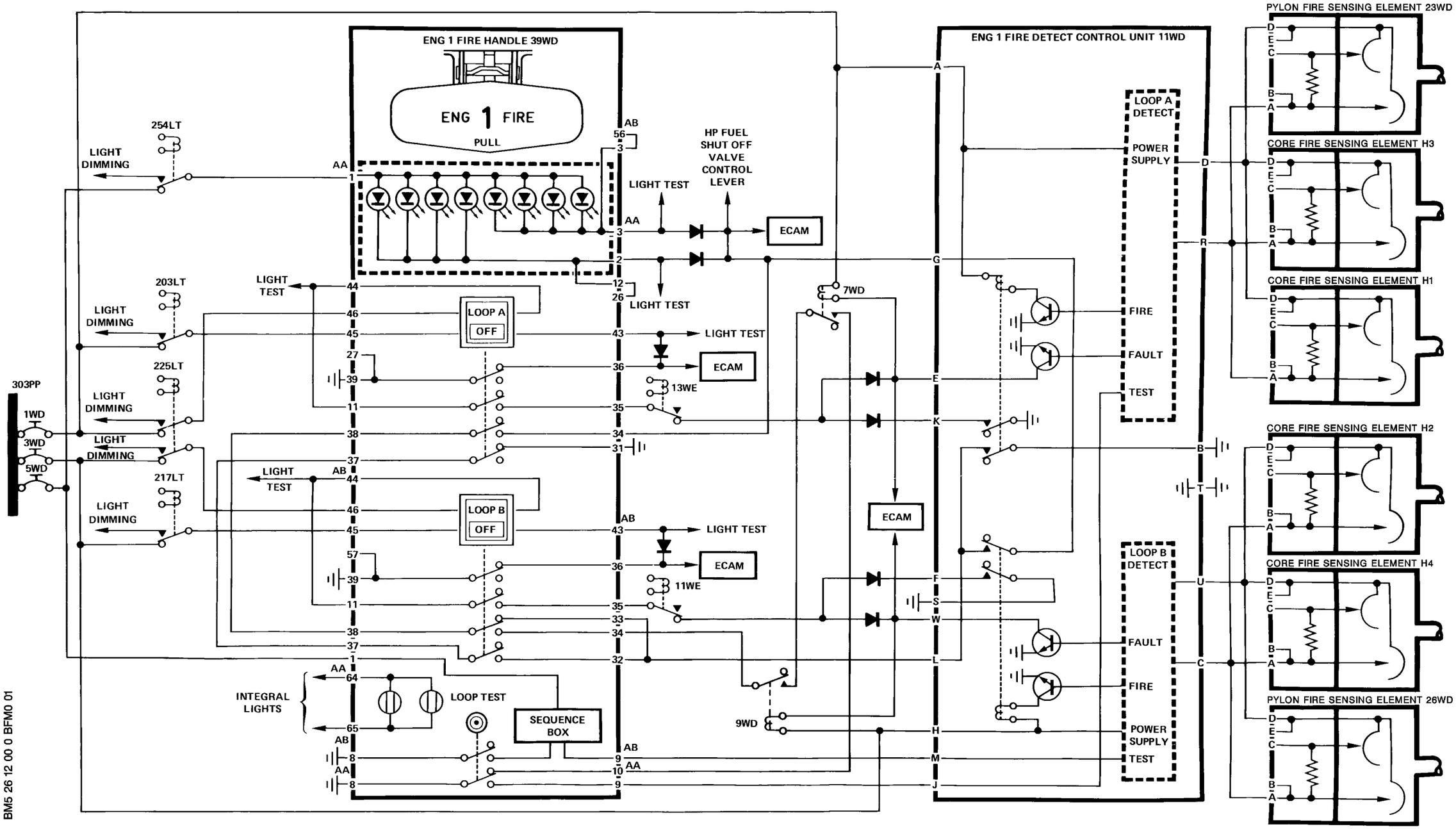
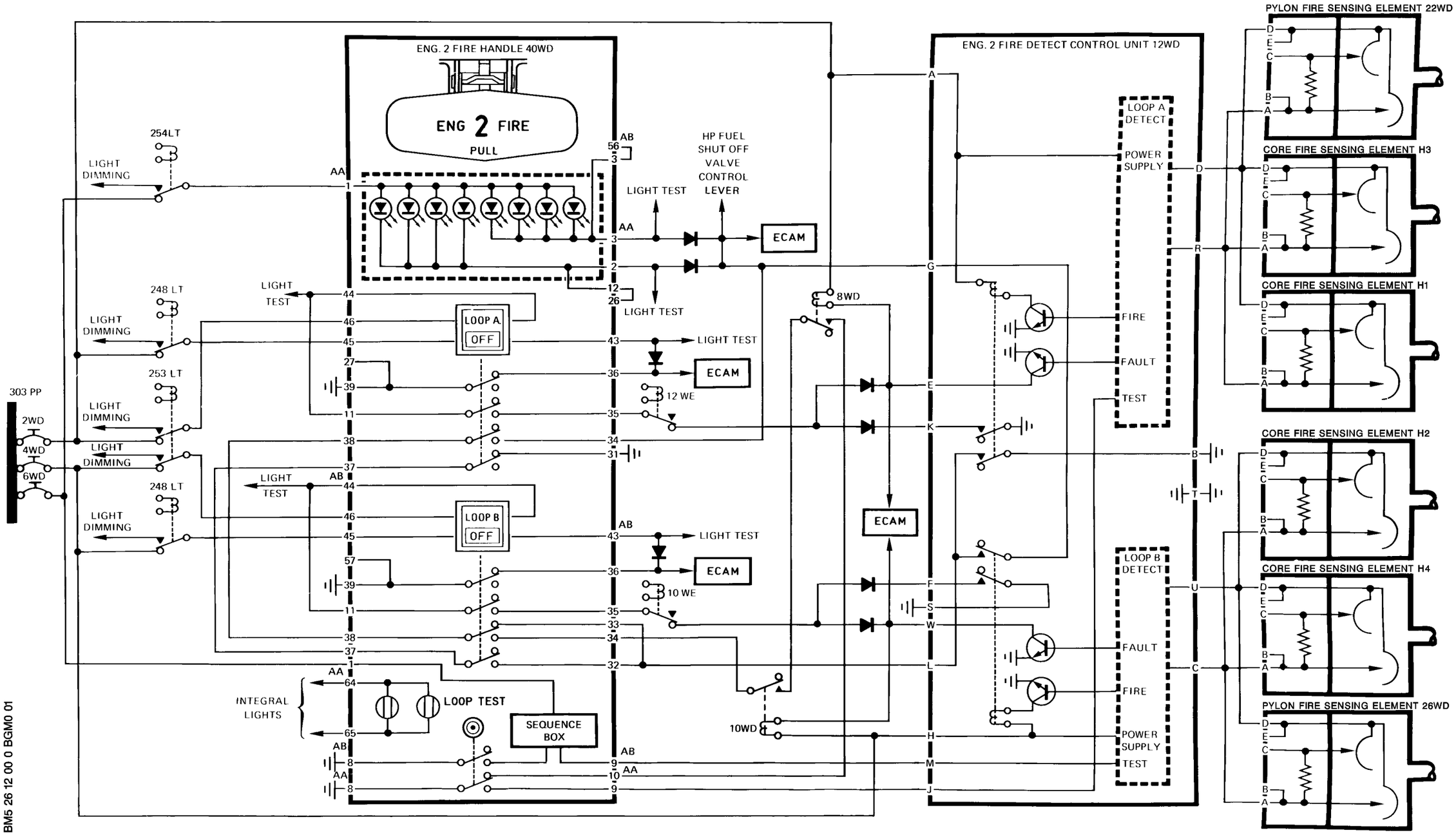



BM5 26 12 00 0 BFM0 01

Eng 1 Fire Detection Electrical Circuit - Schematic
Figure 007

R




BM5 26 12 00 0 BGM0 01

Eng 2 Fire Detection Electrical Circuit - Schematic
Figure 008

R

portion.
When the pressure reaches the sensing element setting value, the switches connected to terminals A and D of the responder close, thus enabling the 28VDC to flow in the aircraft warning circuits.
When the temperature decreases, the pressure drops, the warning switch opens and warning is cancelled. The cycle may be repeated indefinitely without changing the sensing element and responder.
This operation corresponds to an overheat detection.

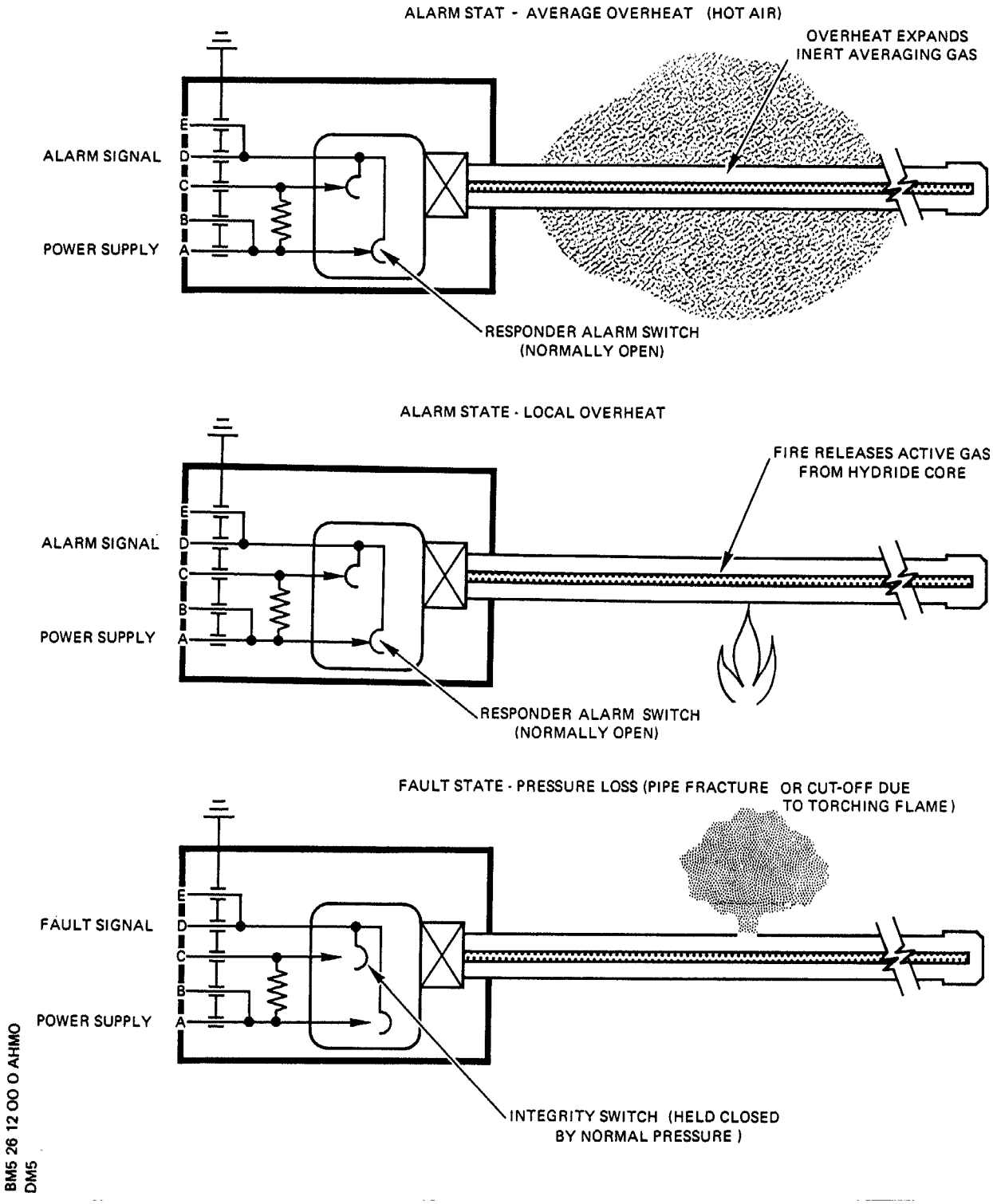
(2) When the sensing element is submitted to local high temperature (in case of flame) with a greater value than the preset one (called discrete value) the central titanium wire inside the sensing element gives off a considerable volume of hydrogen which rapidly increases helium internal pressure. The warning switch closes as in step (a). As soon as the temperature drops below the discrete value (disappearance of the flame), the titanium tube absorbs the hydrogen which has been given off, the pressure drops and the warning is cancelled. The cycle is reversible and may be repeated indefinitely. This mode corresponds to the classical detection of a fire.

(3) A second pressure switch called integrity switch and normally closed, enables the sensing element to be checked for correct condition. This switch is connected to the sensing element self monitoring circuits (FAULT circuit); it also serves to check the correct operation of the detection loops during the pre-flight test.

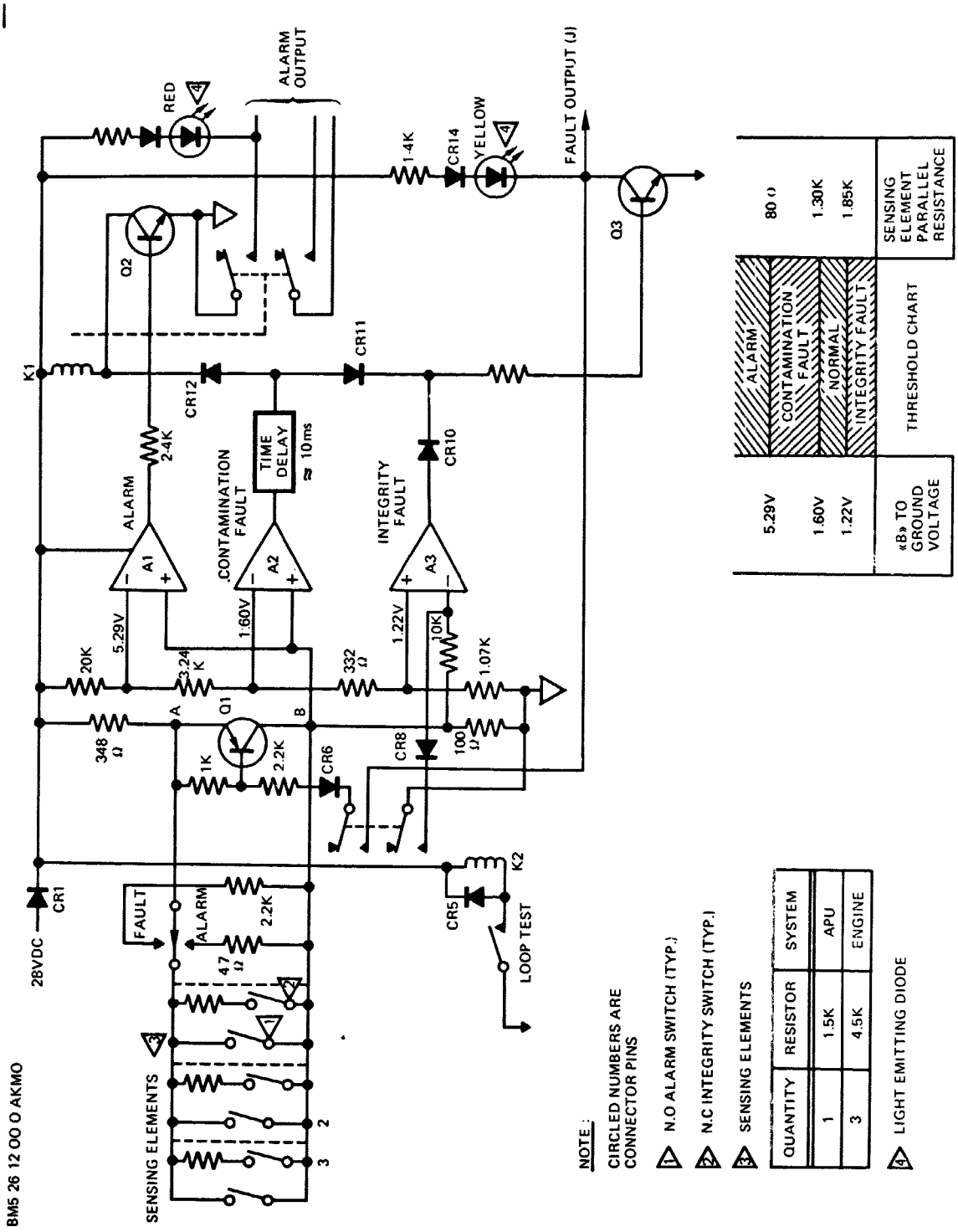
B. Fire Detection Control Unit (Ref. Fig. 006)
The fire detection control unit (one per engine) comprises two control cards which process signals issued from the sensing element responders.
Each card has two separated circuits :
- the FAULT circuit which indicates to the crew members any fault occurring at sensing element/responder level (gas leakage, loss of an electrical signal)
- the FIRE circuit which elaborates the fire warning.

The detection logic of the AND type is implemented inside the control unit according to the following logic diagram :
(Ref. Fig. 010)

C. Operation of the Fault Circuit (Ref. Fig. 011, 012)
The three sensing elements installed in the nacelle and forming each loop, are connected in parallel.
Each sensing element has a 4.5 kΩ resistance and the equivalent resistance of each loop responder is therefore 1.5 kΩ.
Any fault occurring at sensing element/responder level (opening of the integrity switch) series mounted with a 4.5 kΩ internal resistance, or a loss of the electrical signal causes an increase of the equivalent resistance of the two other sensing element responders up to 1.85kΩ.
The voltage at terminal B drops under 1.22VDC, amplifier A3 supplies transistor Q3 which transmits a FAULT signal to the output J of the fire detection control unit.
This description remains applicable in the case of an untimely grounding of a responder.
In case of contamination of the responder or fire detection control unit




Sensing Element - Alarm and Fault States
Figure 009




Engine Fire Detection System - Logic Diagram
Figure 010

connectors, the equivalent resistance drops below 1.3 kΩ and the voltage at terminal B is over 1.6V, amplifier A2 supplies transistor Q3 which transmits a FAULT signal to the output J.
No FAULT signal will be fed for any voltage/resistance value comprised in the interval between 1.22 VDC/1.85 kΩ and 1.6VDC/1.3 kΩ.
NOTE : In normal operation the voltage applied at the output of the 100 Ω resistor, upstream of terminal B is 1.44VDC.

D. Operation of the Fire Circuit (Ref. Fig. 013)
Fire detection by one of the responders causes closure of the corresponding warning switch which creates a voltage higher than the 5.29 V threshold of amplifier A1. Current passes through transistor Q3 and relay K1 is energized thus closing warning switches towards aircraft circuits.
NOTE : The 5.29 V at terminal B also enables supply of amplifier A2, transistor Q2 and relay K1. In case of fire warning, amplifier A2 output is latched by diode CR12 which enables de-energization of FAULT circuits any time FIRE circuits are energized.

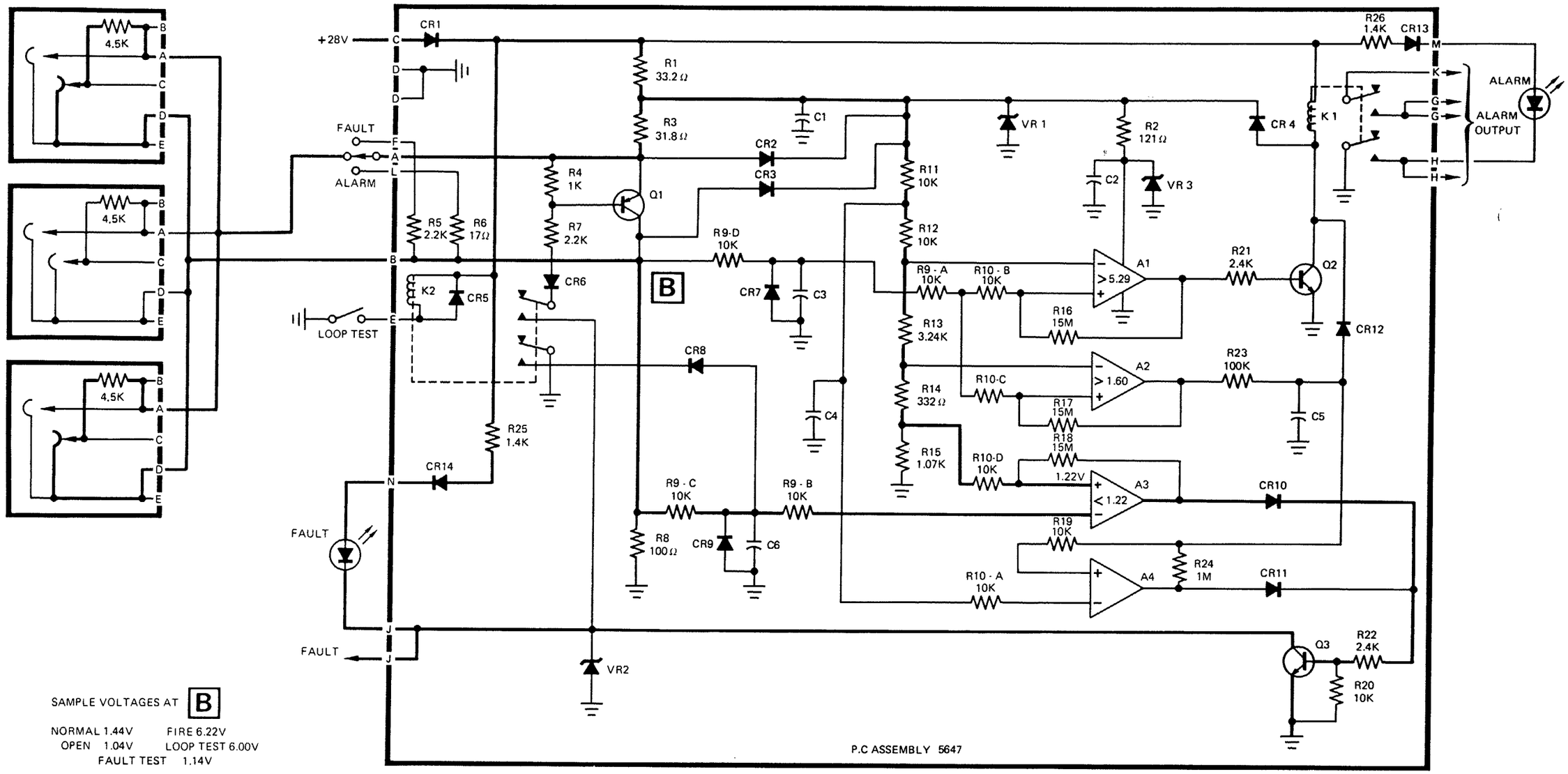
E. Operation of LOOP TEST Circuit (Ref. Fig. 014)
LOOP TEST function enables a simultaneous control of FAULT and FIRE circuits.
When LOOP TEST pushbutton switch is pressed, the two switches of relay K2 close. The lower switch connects the negative terminal of amplifier A3 to ground, which enables transistor Q3 to be supplied (FAULT circuit).
Q3 permits also Q1 to be supplied by means of the upper switch K2. Q1 sends a positive signal, higher than 5.29 V to amplifier A1 input ; transistor Q2 and relay K1 are supplied (FIRE circuit).
NOTE : The 10 kΩ resistor installed upstream of A3 negative input enables an increase in voltage at A1 terminals by means of Q1 and caused by the voltage in FAULT circuit.

F. Test Circuit Used for Maintenance Purpose (Ref. Fig. 006)
In case of fault noted in the operation of a loop, the maintenance personnel can identify the origin of the fault without disconnecting the responders. On the face of the fire detection control unit are installed :
- one rotary selector switch with return in center position
- two pairs of luminescent red and yellow diodes (one pair by loop) : YELLOW is for the FAULT circuit and RED for the FIRE circuit (ALARM).

Positioning of the center selector either towards FAULT or ALARM allows discrimination between fire detection control unit faults and fire sensing elements faults.

5. Utilization of Controls and Indicators

A. Fire Warning
- Warning detected by the two loops, LOOP A and LOOP B :
  LOOP TEST/LOOP A/OFF and LOOP TEST/LOOP B/OFF pushbutton switches are pressed in, LOOP A and LOOP B legends come on.
  ENG1(2) FIRE red warning light on fire handle comes on.
  Red warning light on HP fuel shut off valve control lever comes on to



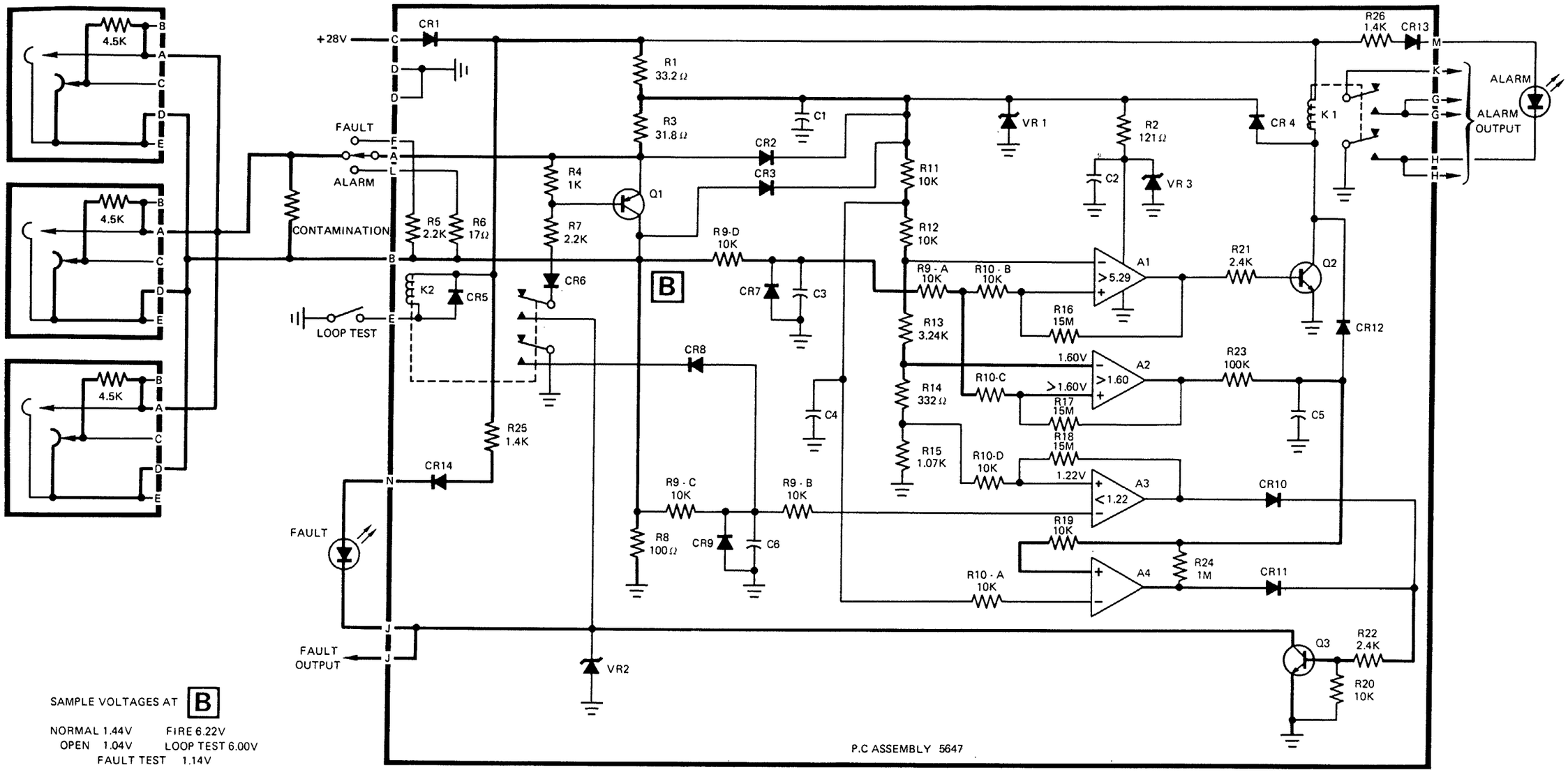

SAMPLE VOLTAGES AT B

NORMAL 1.44V FIRE 6.22V
OPEN 1.04V LOOP TEST 6.00V
FAULT TEST 1.14V

INCREASE IN
DETECTOR RESISTANCE
(E.G PRESSURE LOSS)

BM5 26 12 00 0 ALMO
DM5

Fire Detection Control Unit - Integrity Fault Configuration
Figure 011



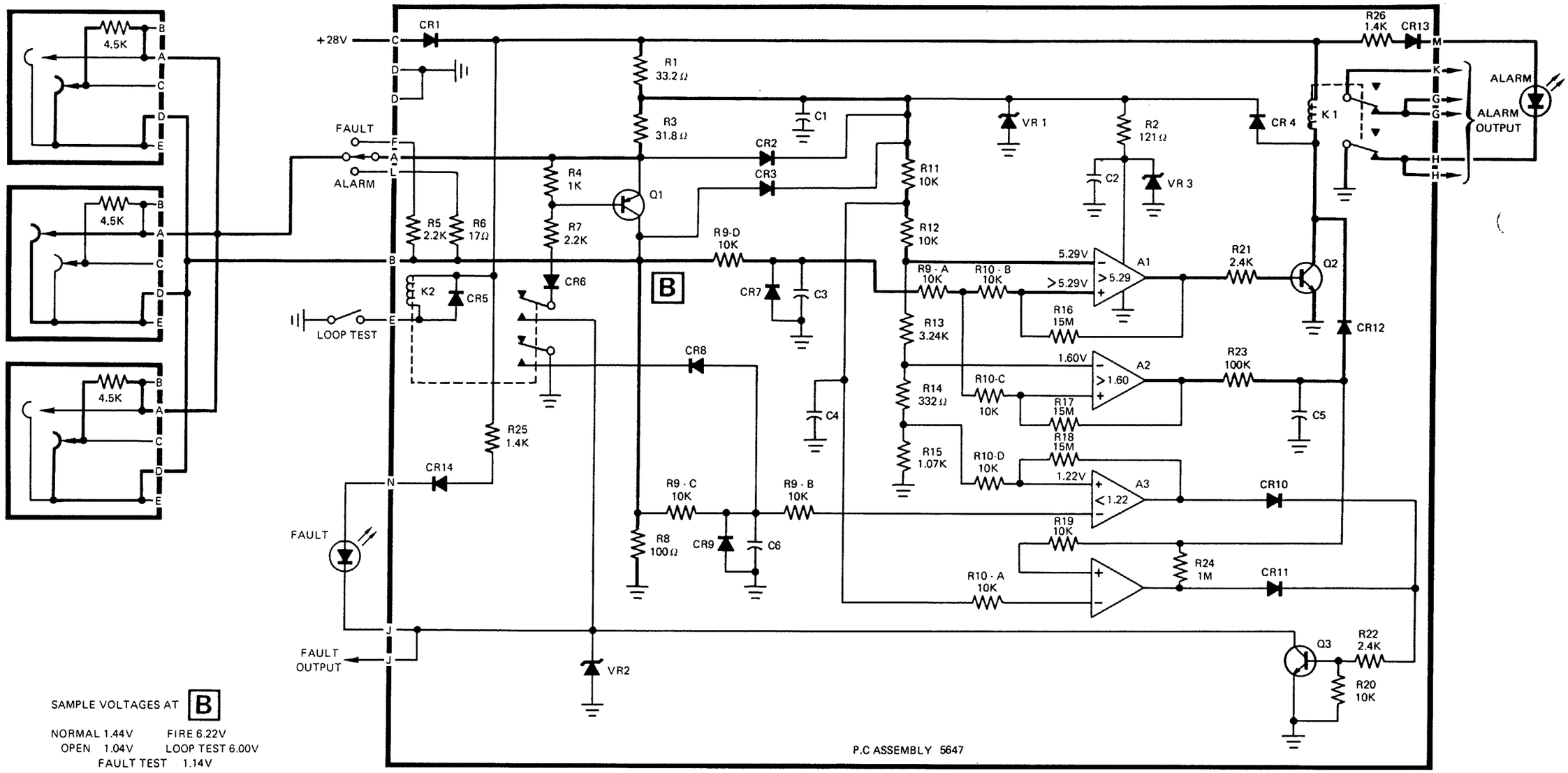

SAMPLE VOLTAGES AT B

NORMAL 1.44V FIRE 6.22V
OPEN 1.04V LOOP TEST 6.00V
FAULT TEST 1.14V

CONTAMINATION FAULT
(E.G SHORT CIRCUIT IN
ELECTRICAL CONNECTOR)

BM5 26 12 00 0 AMMO
DM5

Fire Detection Control Unit - Contamination Configuration
Figure 012

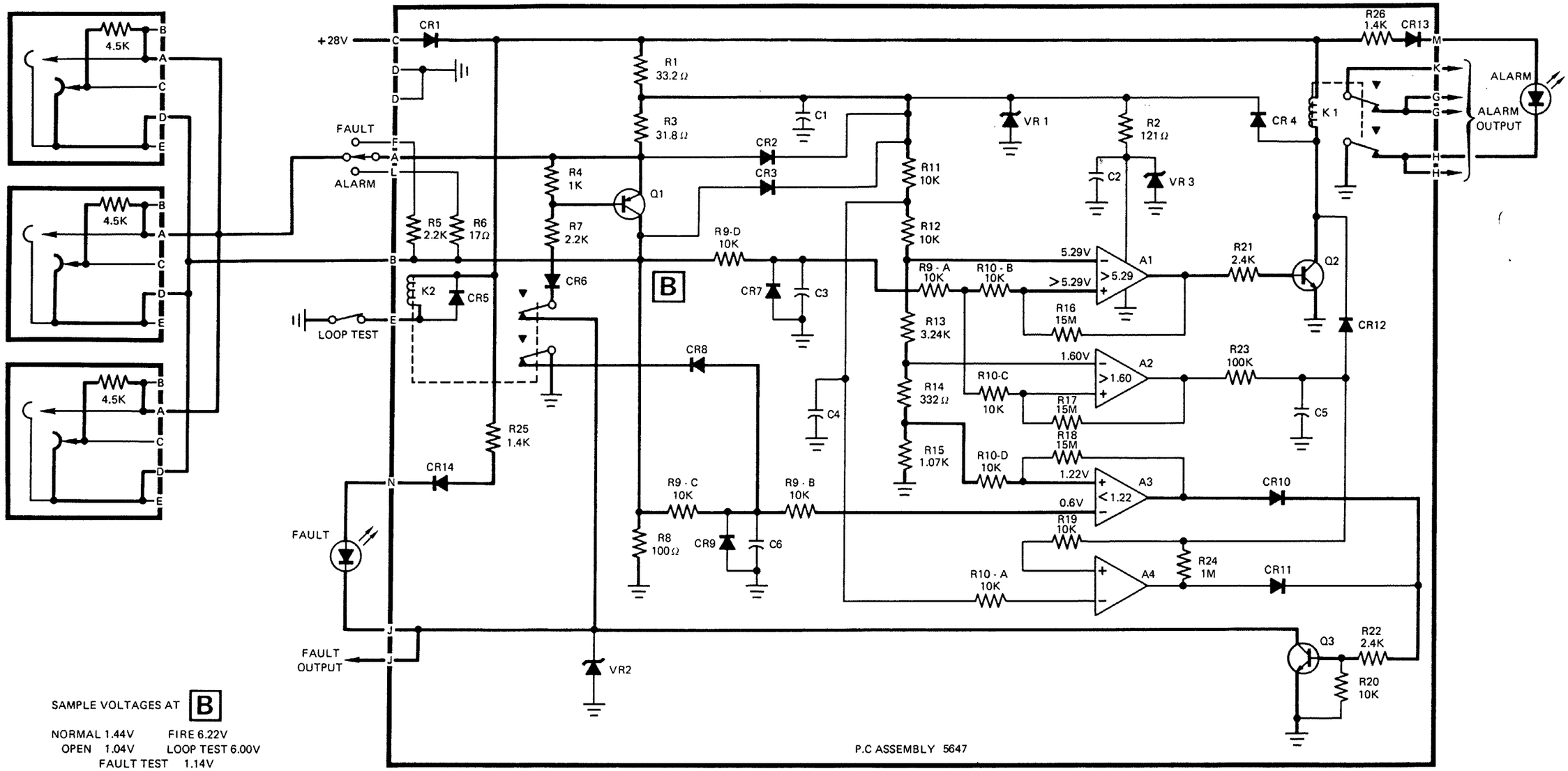



SAMPLE VOLTAGES AT [B]

NORMAL 1.44V FIRE 6.22V
OPEN 1.04V LOOP TEST 6.00V
FAULT TEST 1.14V

BM5 26 12 00 0 ANM0
DM5

Fire Detection Control Unit - Alarm Fire Configuration
Figure 013




SAMPLE VOLTAGES AT **B**

NORMAL 1.44V FIRE 6.22V
OPEN 1.04V LOOP TEST 6.00V
FAULT TEST 1.14V

BM5 26 12 00 0 APMO
DM5

Fire Detection Control Unit - LOOP TEST Configuration
Figure 014

indicate that the valve must be closed.
MASTER WARN light flash on CAPT and F/O main instrument panels 3VU and 5VU and the continous repetitive chime sounds.
ENG FIRE message appears on the L ECAM display unit together with the fire drill instructions.
- Warning detected by only one loop, LOOP A (B) : OFF legend of one of LOOP TEST/LOOP A (B)/OFF pushbutton switch is on ("uniloop" configuration), and on the other pushbutton switch LOOP B (A) legend is on.
The other warnings are the same as those of a dual loop configuration.

B. Faulty Operation of One Loop
The two LOOP TEST/LOOP A and B/OFF pushbutton switches are pressed in.
- LOOP A (B) legend of the faulty loop comes on.
- MASTER CAUTION lights flash on CAPT and F/O main instrument panels 3VU and 5VU.
- The single chime sounds.

A message appears on the ECAM display unit to confirm the loss of one loop. The detection is carried out by the remaining loop.

C. Exceptional Failure : simultaneous fault of the two loops.
Considering the possible reasons which may cause an indication identical to that of a simultaneous fault and in particular the presence of a torch flame directed towards engine pylon lower section (the most likely hypothesis) it has been decided to proceed with this indication as with a fire warning. Consequently, ENG1(2) FIRE handle integral light will come on and a fire warning will be triggered in case of LOOP A and LOOP B legend simultaneous illumination.
(Ref. Fig. 015)

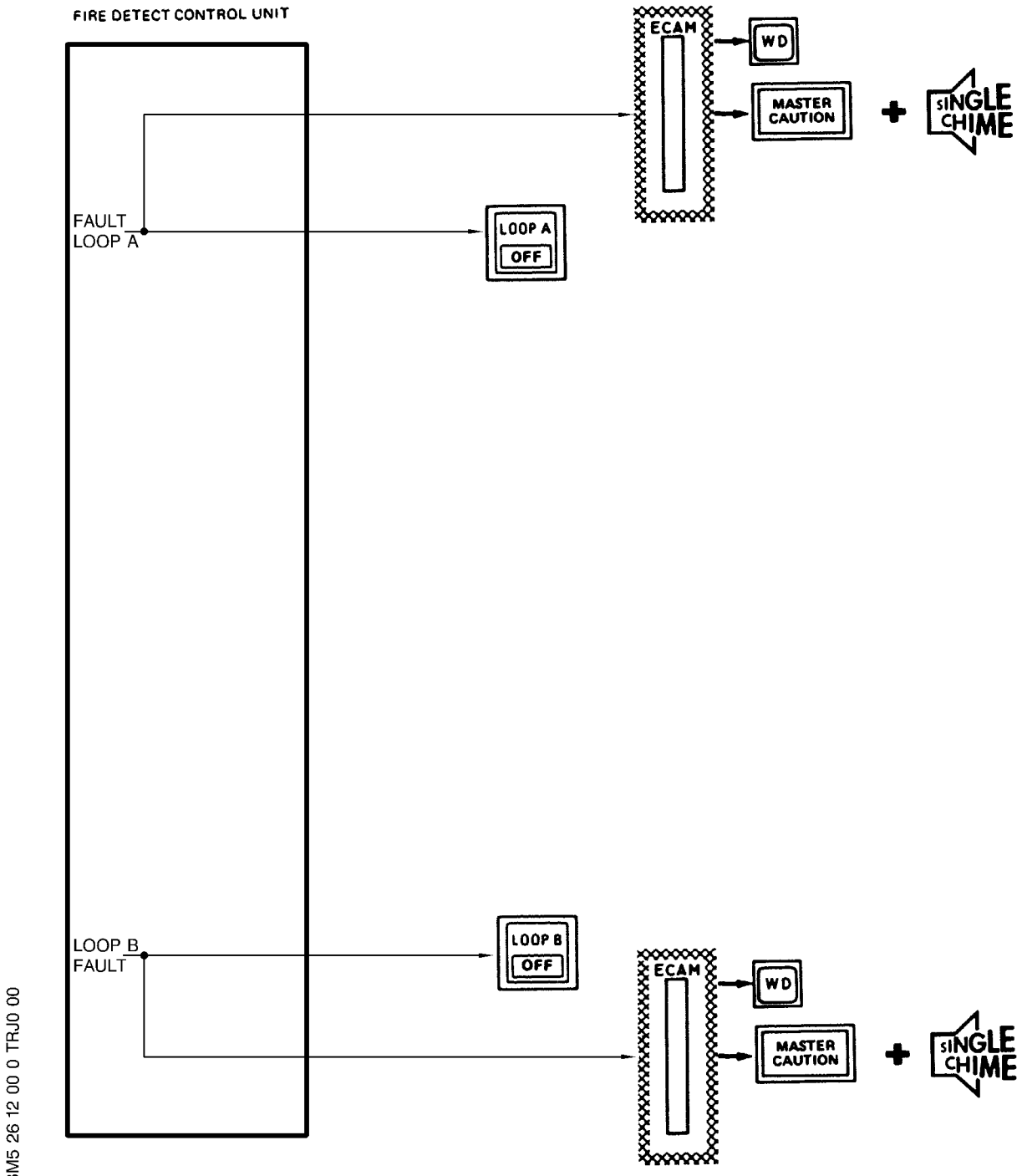
**ON A/C 101-200,

R

(Ref. Fig. 016)

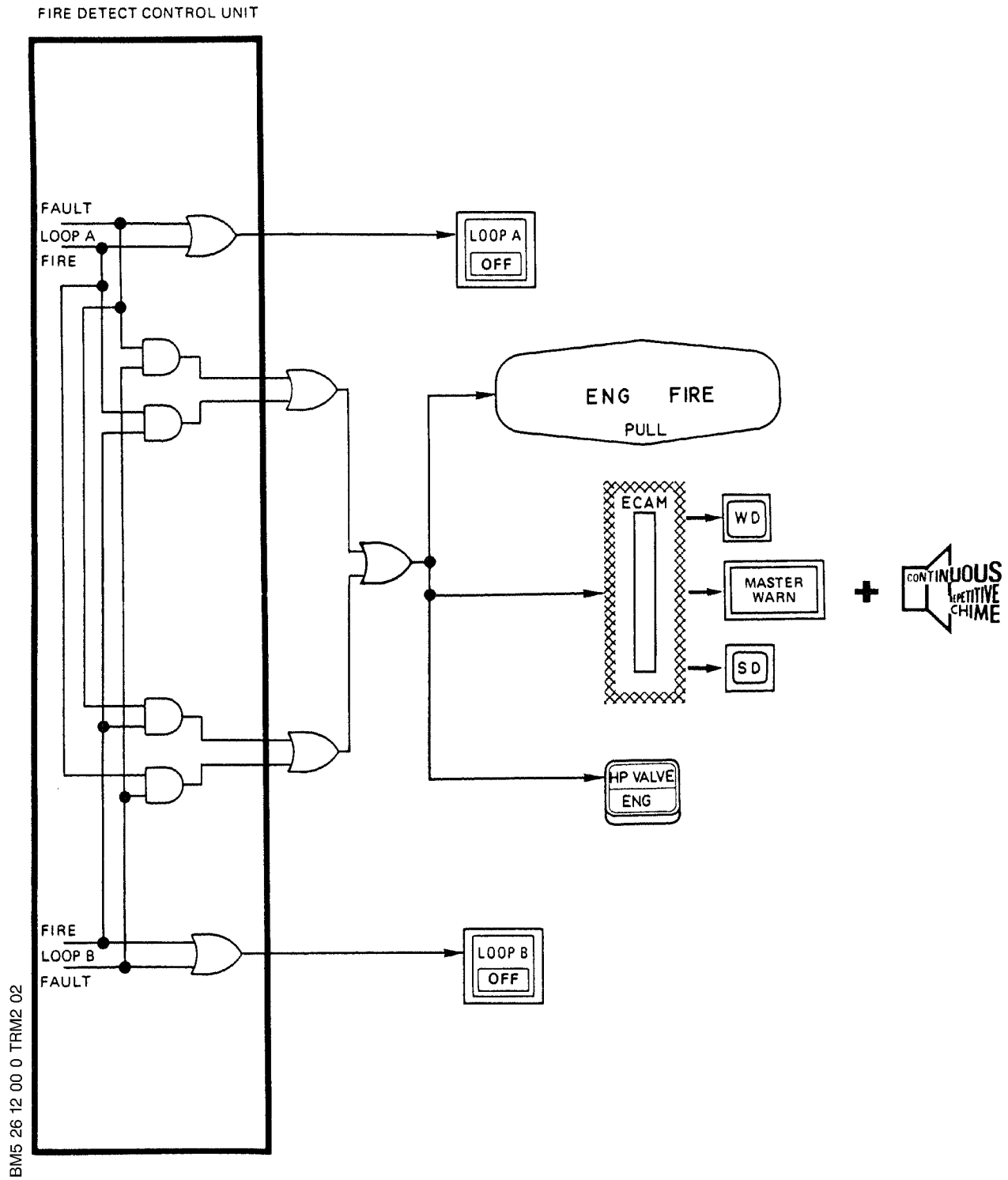
**ON A/C 101-200,

D. LOOP TEST Pushbutton Switch
Press LOOP TEST/LOOP A and B pushbutton switches and then press LOOP TEST pushbutton switch for 4 seconds approximately. The following sequence results in :
(1)Triggering for 2 seconds of loop A FAULT and FIRE circuits which causes illumination of LOOP A legend.
During and after 1.5 seconds, MASTER CAUTION lights flash on CAPT and F/O main instrument panels 3VU and 5VU, the single chime sounds and a message appears on the ECAM display unit.
(2)Triggering of loop A and B FAULT and FIRE circuits which causes illumination of LOOP A and LOOP B legends, fire handle integral light.
MASTER WARN lights also flash on CAPT and F/O main instrument panels




Fire Detection Indicating - Fault Logic Diagram
Figure 015

R




Fire Detection Indicating - Fire Logic Diagram
Figure 016

3VU and 5VU, the HP fuel shut off valve control lever integral light comes on, the repetitive chime sounds and a message appears on the ECAM display unit.

(3) When LOOP TEST pushbutton switch is released, FAULT and FIRE circuits of loop B are triggered (2 seconds).
During and after 1.5 seconds, MASTER CAUTION lights flash on CAPT and F/O main instrument panels 3VU and 5VU, the single chime sounds and a message appears on the ECAM display unit.

# ENGINE FIRE AND OVERHEAT DETECTION - DESCRIPTION AND OPERATION

## 1. General

The engine fire detection system consists in two continuous loops connected in parallel and connected to a fire detection control unit according to an **AND** logic. A self monitoring device for the fire sensing elements enables any detection loop loss to be indicated to the crew members.
For one engine each loop comprises :
(Ref. Fig. 003)

- two fire sensing element assemblies connected in parallel and installed in the core low part around the gearbox and above the combustion chamber.
- one fire detection control unit installed in electronics rack 90VU, shelf 96VU (Ref. Fig. 001)
- one control and indicating assembly located in the flight compartment overhead panel

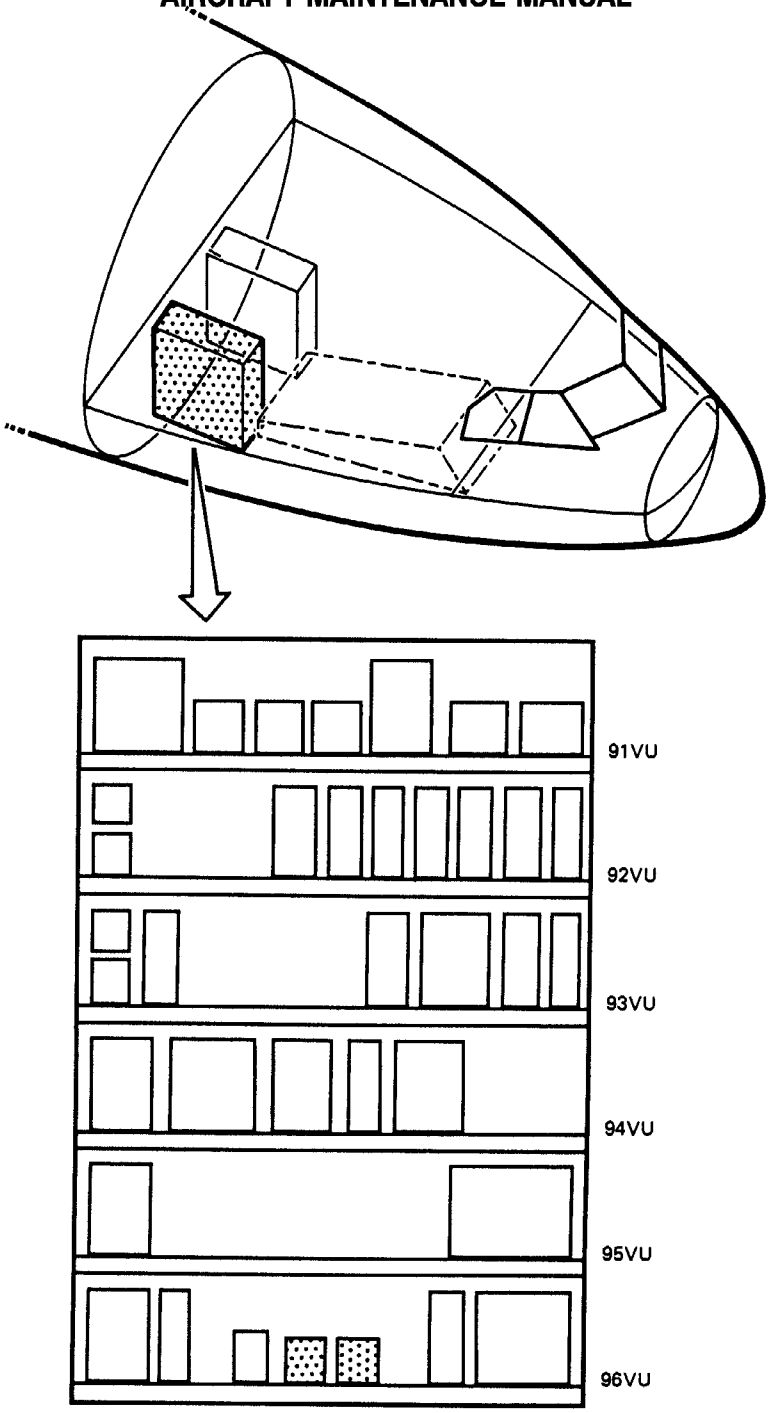
## 2. Component Location

(Ref. Fig. 001)
(Ref. Fig. 002)

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 11WD | CTL UNIT-FIRE DET, ENG1 | 96VU | 122 | 132AZ | 26-12-11 |
| 12WD | CTL UNIT-FIRE DET, ENG2 | 96VU | 122 | 132AZ | 26-12-11 |
| 39WD | HANDLE-ENG1 FIRE | 20VU | 211 | | 26-12-20 |
| 40WD | HANDLE-ENG2 FIRE | 20VU | 211 | | 26-12-20 |
| 22WD | SENSING ELEMENT-FIRE, 2 | | 440/ 460 | 445AL/ 461AL 446AR/ 462AR | 26-12-12 |
| 23WD | SENSING ELEMENT-FIRE, 1 | | 430/ 450 | 435AL/ 451AL 436AR/ 452AR | 26-12-12 |
| 26WD | SENSING ELEMENT-FIRE, 2 | | 440/ 460 | 445AL/ 461AL 446AR/ 462AR | 26-12-12 |
| 27WD | SENSING ELEMENT-FIRE, 1 | | 430/ 450 | 435AL/ 451AL 436AR/ 452AR | 26-12-12 |
| H1 | SENSING ELEMENT-FIRE LOOP A, R CORE | | 430/ 450 440/ 460 | 436AR/ 452AR 446AR/ 462AR | 26-12-12 |
| H2 | SENSING ELEMENT-FIRE LOOP A, L CORE | | 430/ 450 440/ 460 | 435AL/ 451AL 445AL/ 461AL | 26-12-12 |
| H3 | SENSING ELEMENT-FIRE | | 430/ | 436AR/ | 26-12-12 |

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| | LOOP B, R CORE | | 450 | 452AR | |
| | | | 440/ | 446AR/ | |
| | | | 460 | 462AR | |
| H4 | SENSING ELEMENT-FIRE | | 430/ | 435AL/ | 26-12-12 |
| | LOOP B, L CORE | | 450 | 451AL | |
| | | | 440/ | 445AL/ | |
| | | | 460 | 461AL | |

(Ref. Fig. 003)

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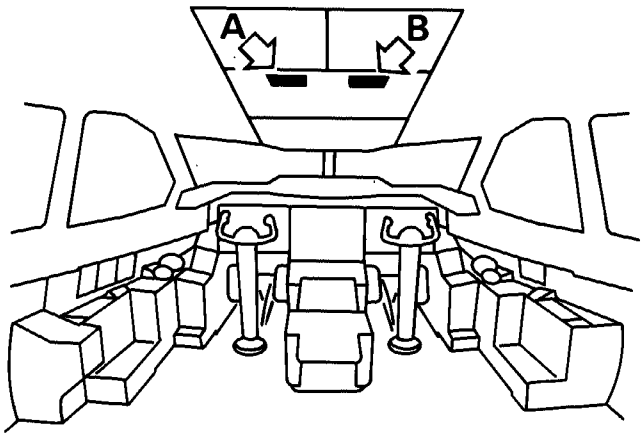
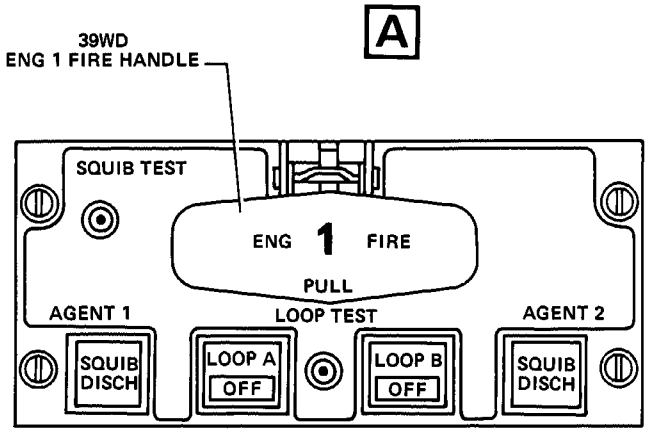
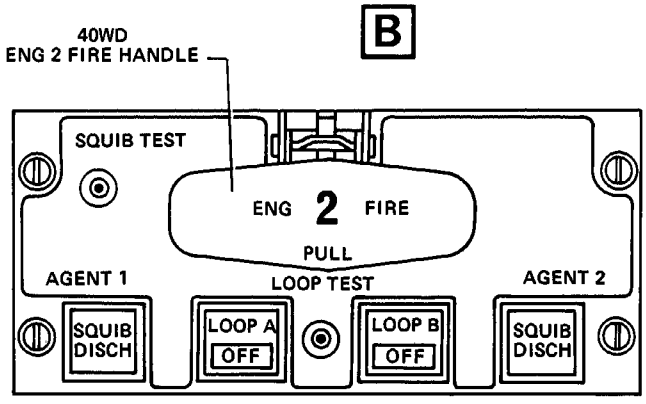
Component Location Fire Detection Control Unit
Figure 001

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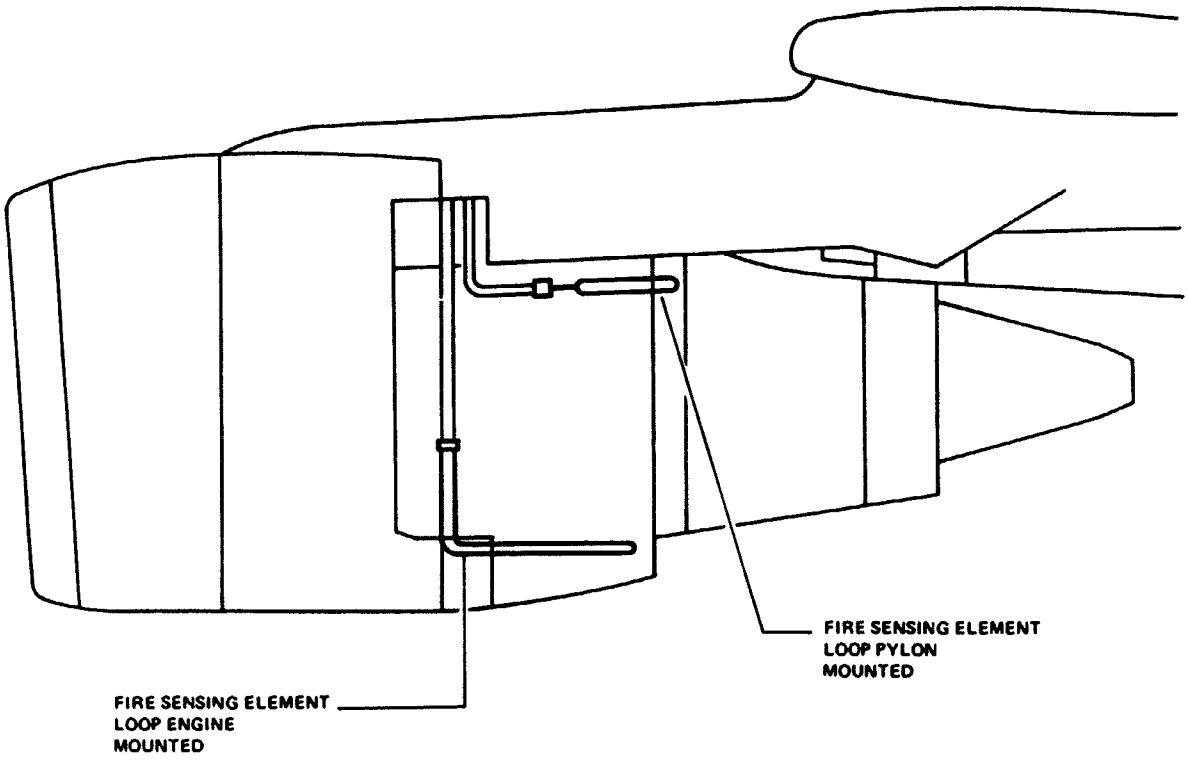
Control and Indicating - Component Location
Figure 002

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Component Location - Fire Sensing Elements
Figure 003

3. Description
(Ref. Fig. 004)
(Ref. Fig. 005)

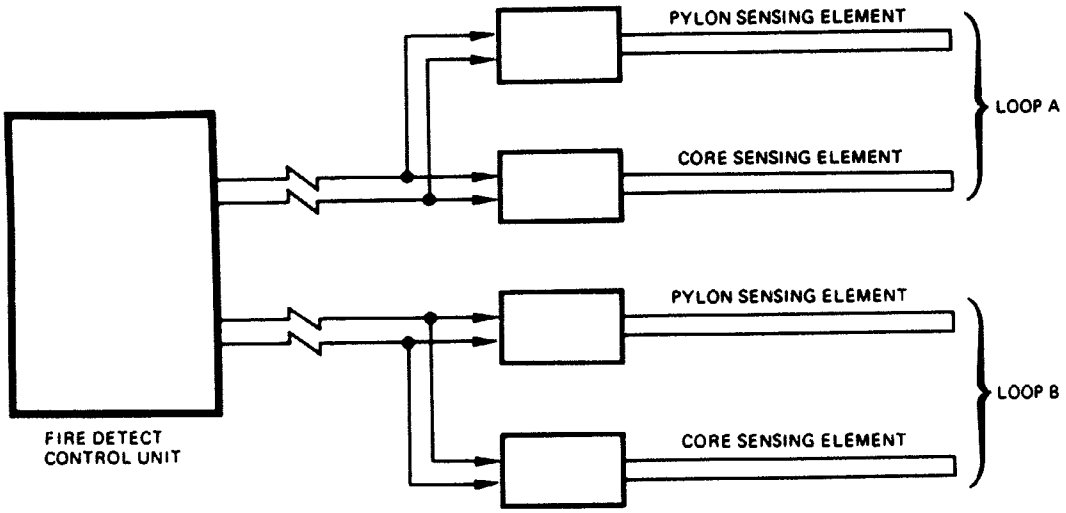
A. Fire Sensing Element
The fire sensing element consists in a stainless steel tube, the outer diameter of which is 0.063 in. (1.6 mm) and thickness 0.018 in. (0.46 mm).
Inside this tube is routed a titanium tube containing hydrogen. This central core is inserted into a spiral made up of an inert material having the special property of giving off and absorbing a gas.
The gap comprised between the core and the sensing element outer tube wall is fitted with helium at an initial pressure of 2 to 3 bars depending on the setting temperature selected for each sensing element.
The sensing element reacts according to the ideal gas law.
One end of the sensing element is hermetically soldered and the other one is connected to a one inch (25.4 mm) dia. stainless steel body called responder.
The responder contains a chamber connected to two pressure switches : a warning switch and an integrity switch.
The free end of the responder is connected to the aircraft circuit electrical harness.

B. Fire Detection Control Unit (Ref. Fig. 006)
The fire detection control unit processes warning signals proceeding from the responders according to an **AND** logic and triggers the corresponding warnings in the flight compartment (**FIRE** warning circuit).
Moreover, a **FAULT** circuit for each loop, separated from the **FIRE** warning circuit enables the crew members to be aware of any fire sensing element faulty operation such as sensing element leakage, loss of an electrical signal from the responder.

C. Control and Indicating Assembly
(Ref. Fig. 007)
(Ref. Fig. 008)
Controls and indications are located on the overhead panel and comprise for each engine :
- two mechanically latched **LOOP TEST/LOOP A/OFF** and **LOOP B/OFF** pushbutton switches with integral amber light.
- one **LOOP TEST** pushbutton switch
- one **ENG1 (2) FIRE** handle with integral red warning light
- on **CAPT** and **F/O** main instrument panels **3VU** and **5VU**
  . one **MASTER WARN** light
  . one **MASTER CAUTION** light
  NOTE : The **ECAM** display unit enables checking of the fire detection loop integrity in the various indication cases (Ref. para. **D**).

4. Operation

A. Fire Sensing Element (Ref. Fig. 009)
(1)When the sensing element is submitted to an increase in temperature over a certain length, the internal pressure of the helium increases in pro-

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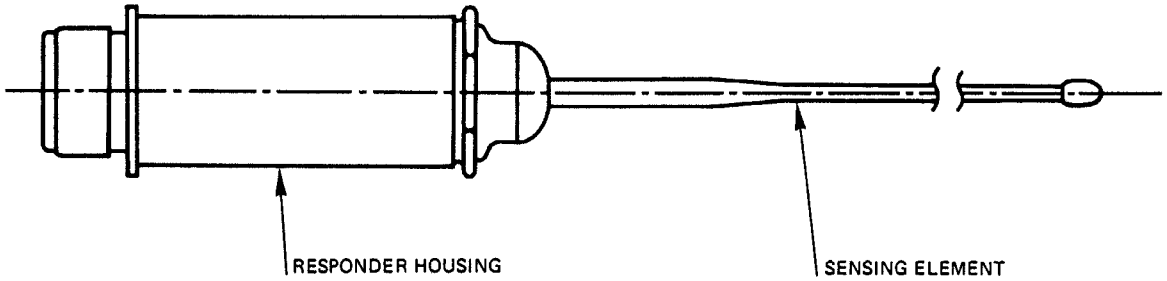
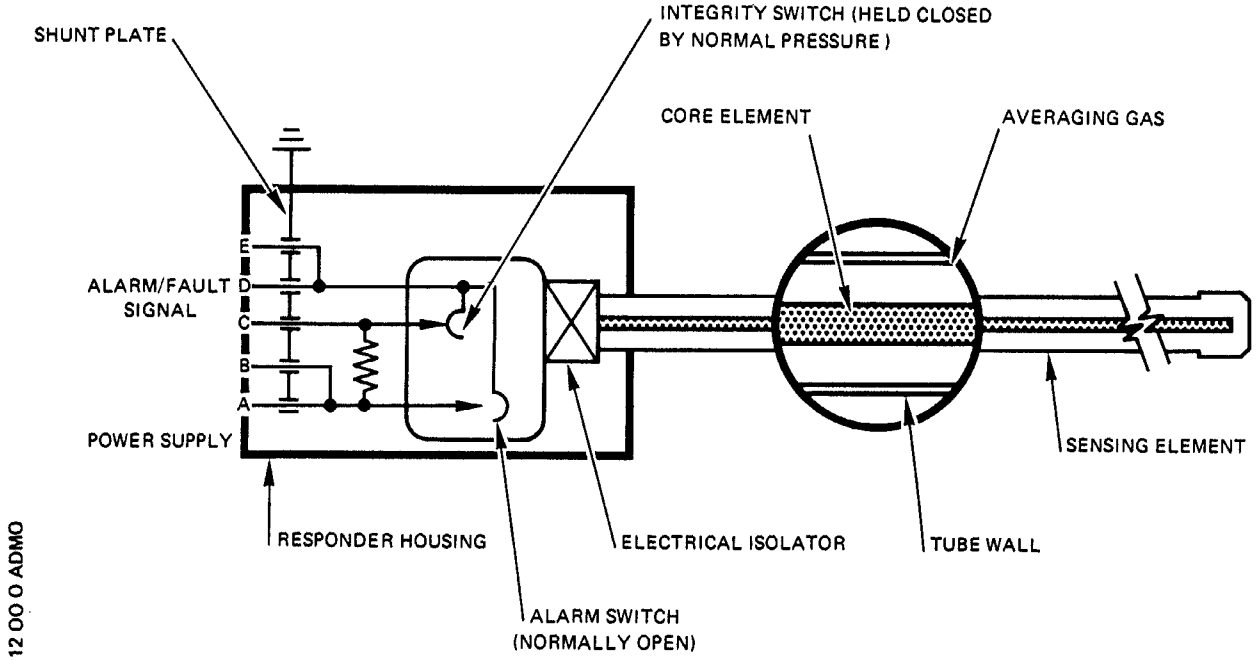
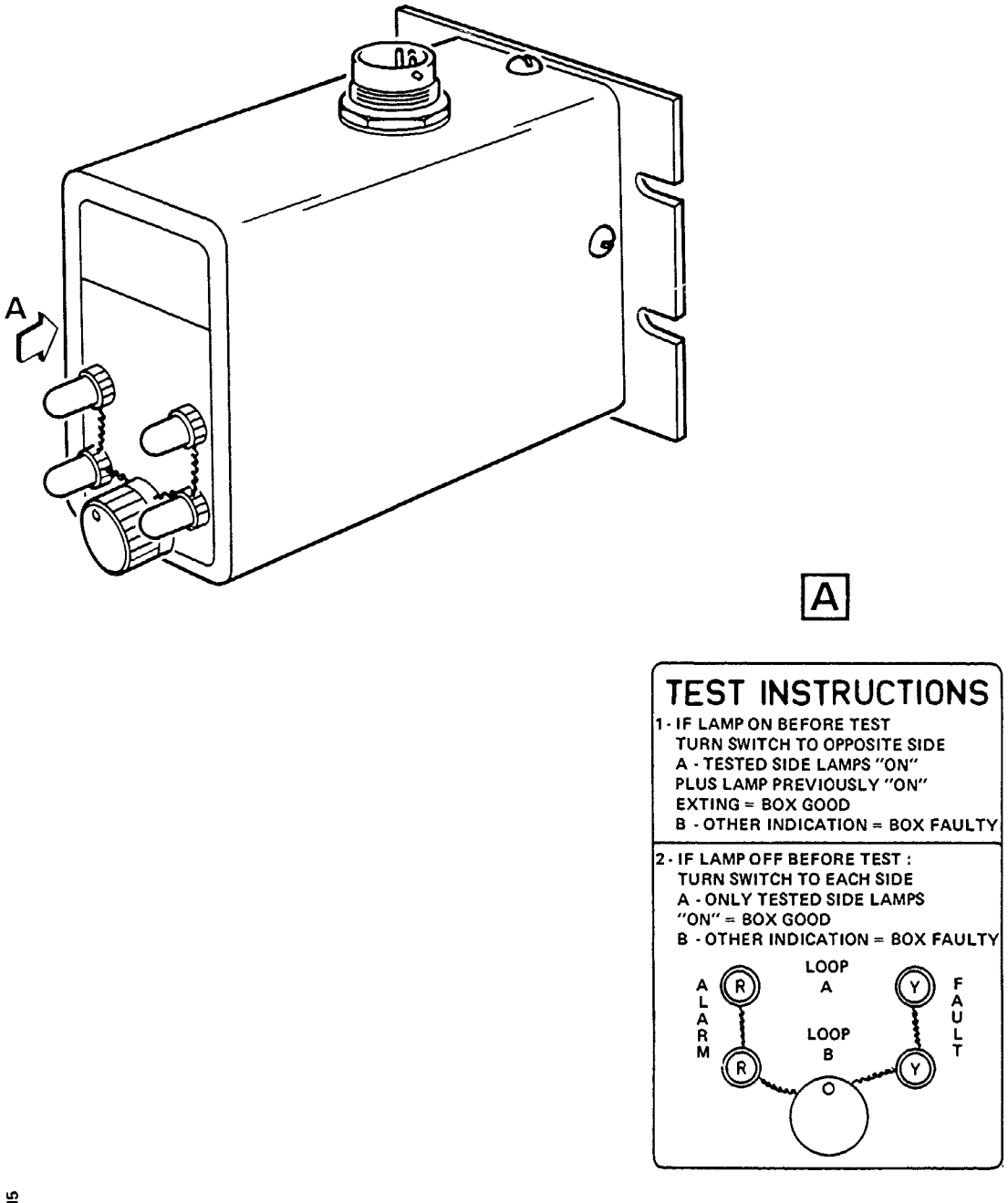
Engine Fire Detection - Schematic
Figure 004




Fire Sensing Element - Schematic
Figure 005

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Fire Detection Control Unit
Figure 006

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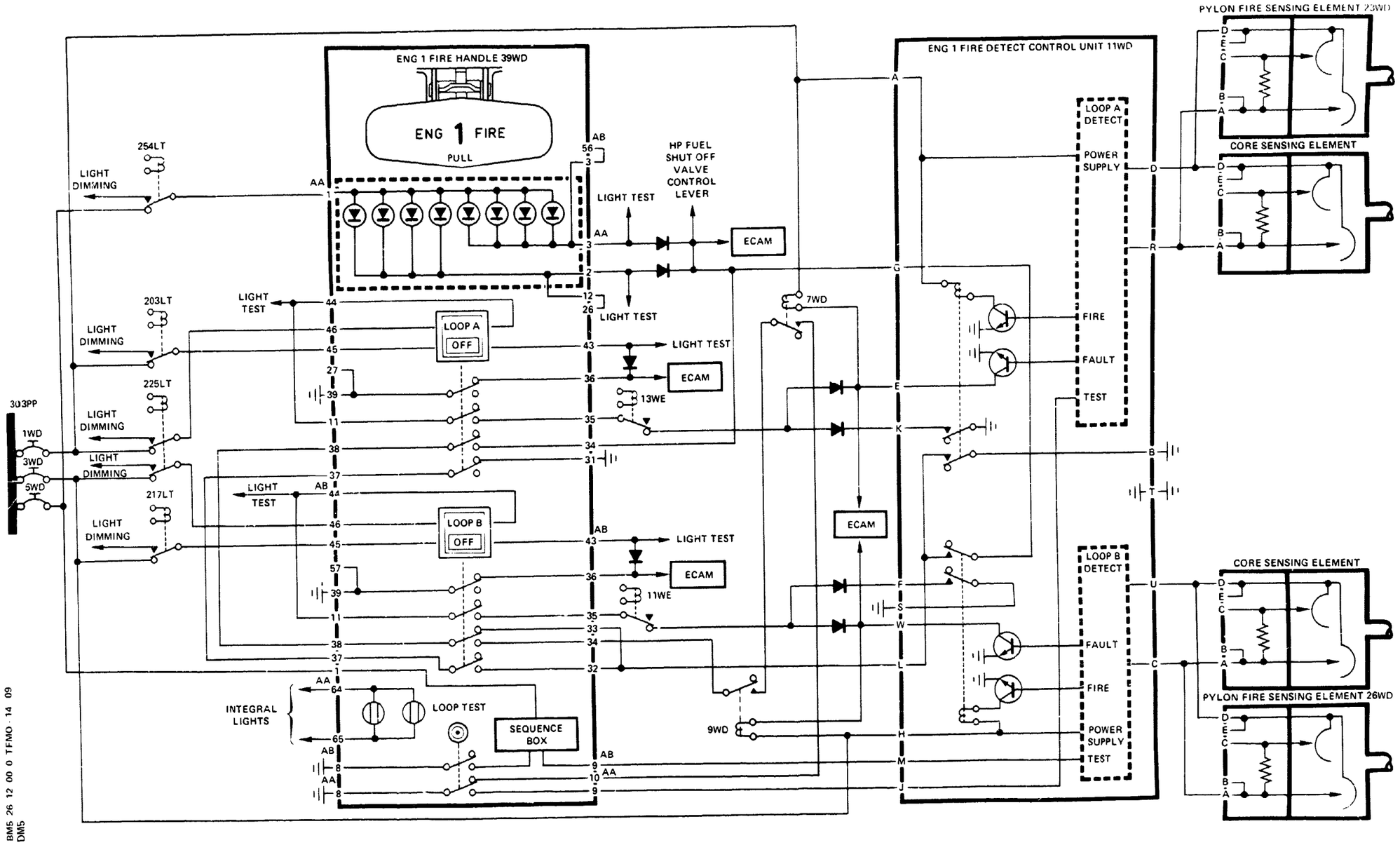


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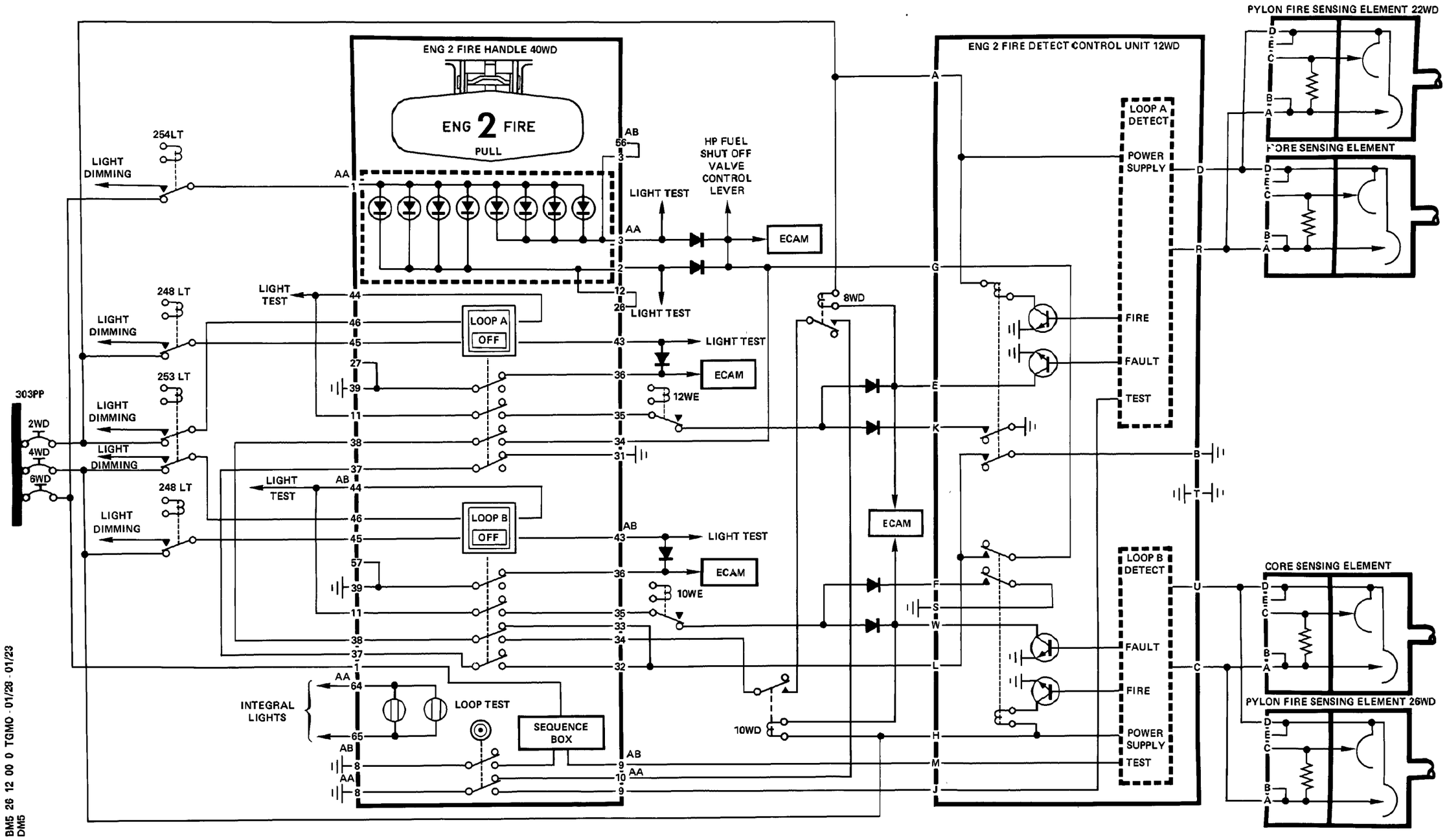
Eng 1 Fire Detection Electrical Circuit - Schematic
Figure 007

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Eng 2 Fire Detection Electrical Circuit - Schematic *
Figure 008

portion.
When the pressure reaches the sensing element setting value, the switches connected to terminals A and D of the responder close, thus enabling the 28VDC to flow in the aircraft warning circuits.
When the temperature decreases, the pressure drops, the warning switch opens and warning is cancelled. The cycle may be repeated indefinitely without changing the sensing element and responder.
This operation corresponds to an overheat detection.

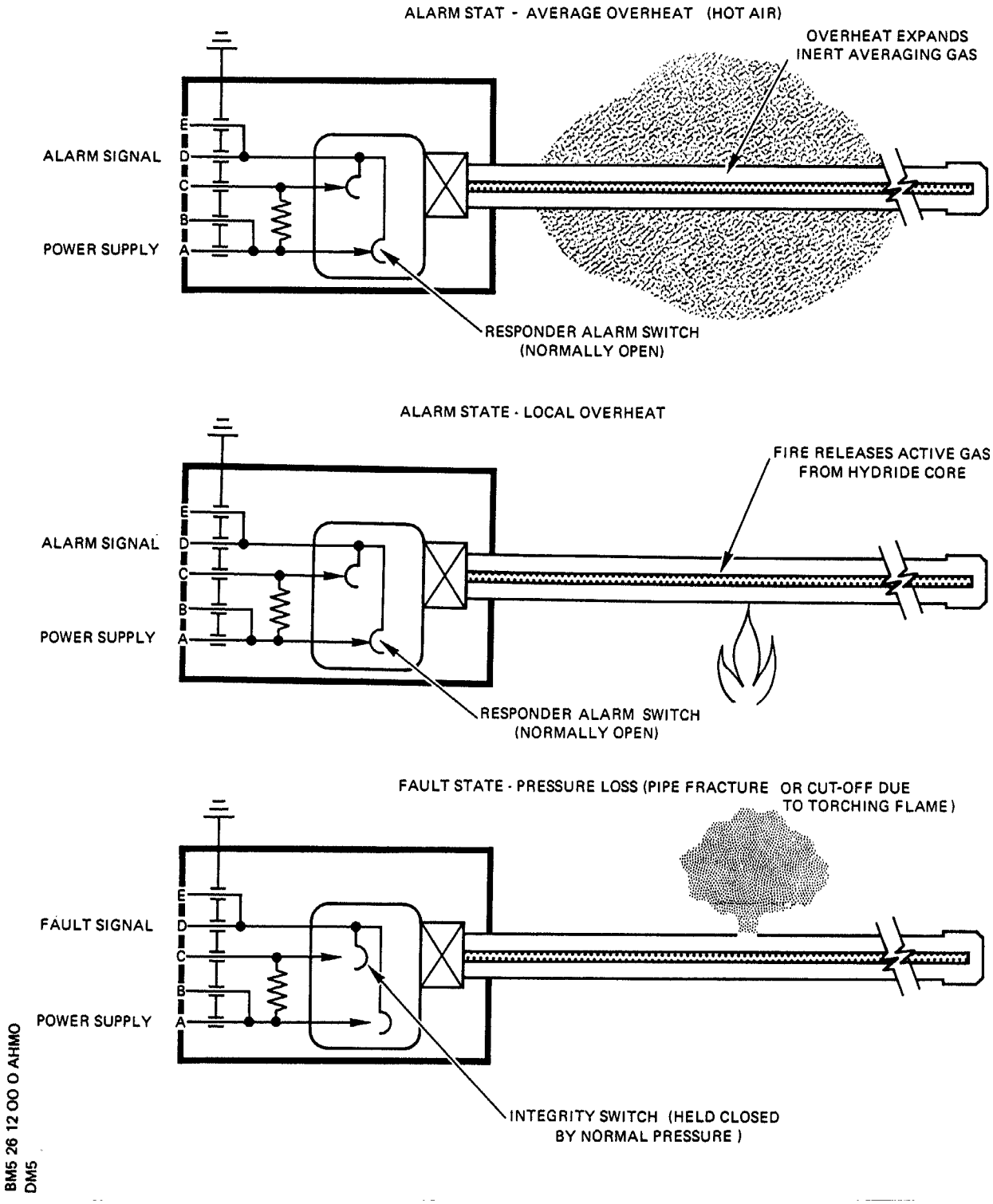
(2) When the sensing element is submitted to local high temperature (in case of flame) with a greater value than the preset one (called discrete value) the central titanium wire inside the sensing element gives off a considerable volume of hydrogen which rapidly increases helium internal pressure. The warning switch closes as in step (a). As soon as the temperature drops below the discrete value (disappearance of the flame), the titanium tube absorbs the hydrogen which has been given off, the pressure drops and the warning is cancelled. The cycle is reversible and may be repeated indefinitely. This mode corresponds to the classical detection of a fire.

(3) A second pressure switch called integrity switch and normally closed, enables the sensing element to be checked for correct condition. This switch is connected to the sensing element self monitoring circuits (FAULT circuit); it also serves to check the correct operation of the detection loops during the pre-flight test.

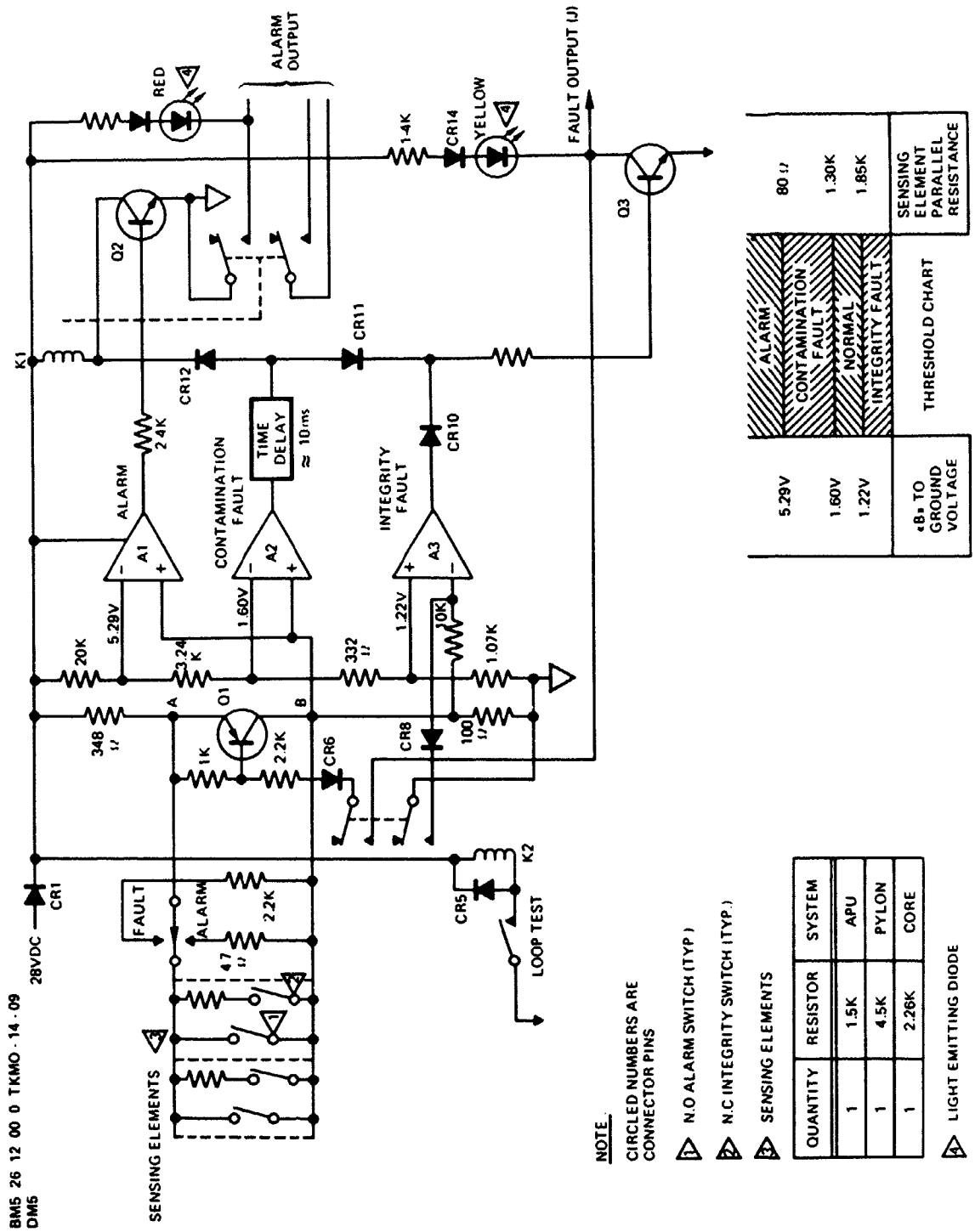
B. Fire Detection Control Unit (Ref. Fig. 006)
The fire detection control unit (one per engine) comprises two control cards which process signals issued from the sensing element responders.
Each card has two separated circuits :
- the FAULT circuit which indicates to the crew members any fault occurring at sensing element/responder level (gas leakage, loss of an electrical signal)
- the FIRE circuit which elaborates the fire warning.

The detection logic of the AND type is implemented inside the control unit according to the following logic diagram :
(Ref. Fig. 010) :

C. Operation of the Fault Circuit (Ref. Fig. 011, 012)
The two sensing elements installed in the nacelle and forming each loop, are connected in parallel.
The core and the pylon fire sensing elements have respectualy a 2.26 kΩ and 4.5 kΩ resistances ; the equivalent resistance of each loop is therefore 1.5 kΩ
When fault occurs at sensing element/responder level either opening of the integrity switch (disconnecting of the 2.26 kgΩ or 4.5 kΩ internal resistances) or loss of the electrical signal causes an increase of the equivalent resistance due to the other sensing element responders up to 1.85 kΩ.
The voltage at terminal B drops under 1.22VDC, amplifier A3 supplies transistor Q3 which transmits a FAULT signal to the output J of the fire detection control unit.
This description remains applicable in the case of an untimely grounding




Sensing Element - Alarm and Fault States
Figure 009




| QUANTITY | RESISTOR | SYSTEM |
|---|---|---|
| 1 | 1.5K | APU |
| 1 | 4.5K | PYLON |
| 1 | 2.26K | CORE |

Engine Fire Detection System - Logic Diagram
Figure 010

of a responder.
In case of contamination of the responder or fire detection control unit connectors, the equivalent resistance drops below 1.3 kΩ and the voltage at terminal B is over 1.6V, amplifier A2 supplies transistor Q3 which transmits a FAULT signal to the output J.
No FAULT signal will be fed for any voltage/resistance value comprised in the interval between 1.22 VDC/1.85 kΩ and 1.6VDC/1.3 kΩ.
NOTE : In normal operation the voltage applied at the output of the 100 Ω resistor, upstream of terminal B is 1.44VDC.

D. Operation of the Fire Circuit (Ref. Fig. 013)
Fire detection by one of the responders causes closure of the corresponding warning switch which creates a voltage higher than the 5.29 V threshold of amplifier A1. Current passes through transistor Q3 and relay K1 is energized thus closing warning switches towards aircraft circuits.
NOTE : The 5.29 V at terminal B also enables supply of amplifier A2, transistor Q2 and relay K1. In case of fire warning, amplifier A2 output is latched by diode CR12 which enables de-energization of FAULT circuits any time FIRE circuits are energized.

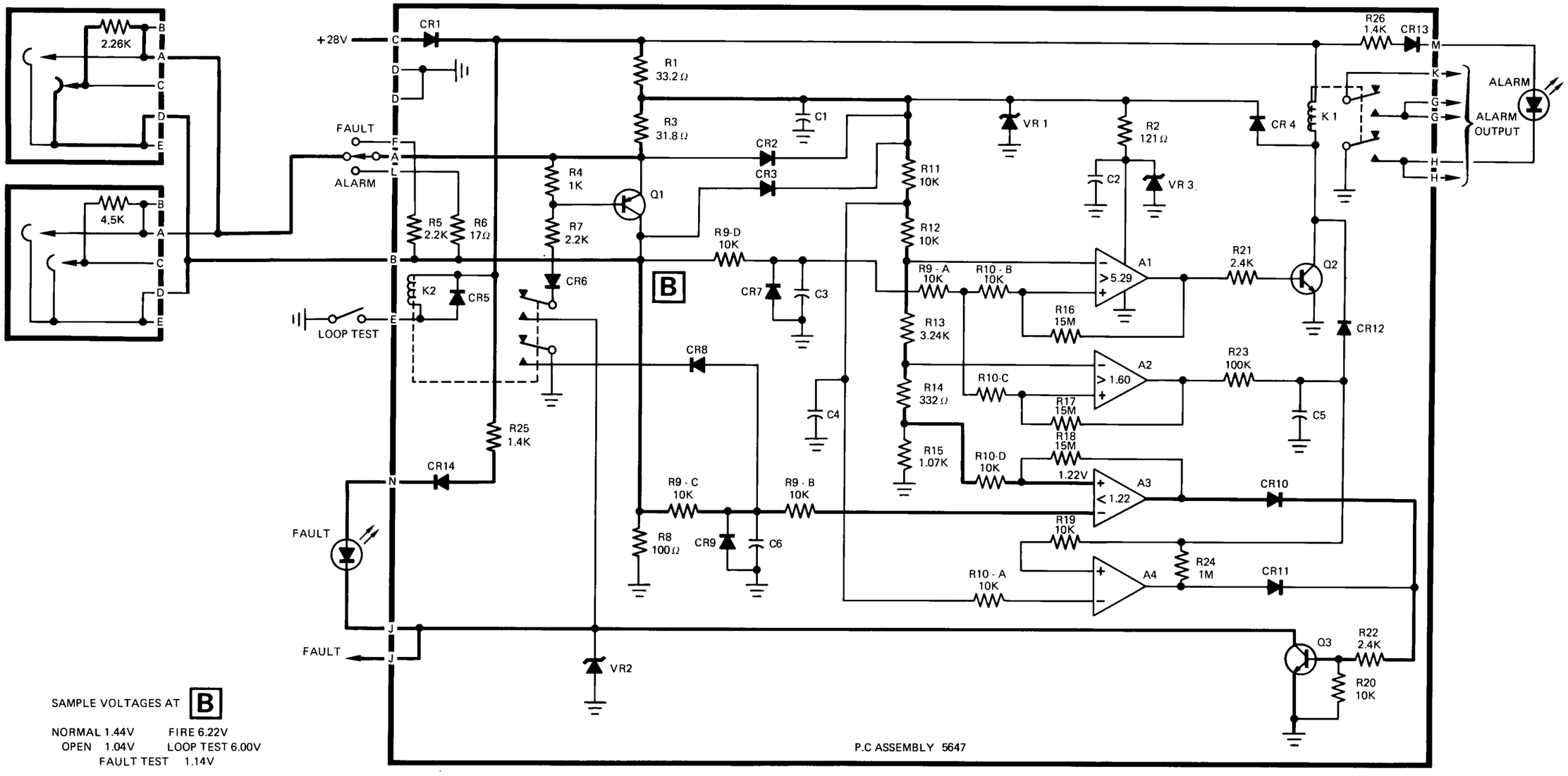
E. Operation of LOOP TEST Circuit (Ref. Fig. 014)
LOOP TEST function enables a simultaneous control of FAULT and FIRE circuits.
When LOOP TEST pushbutton switch is pressed, the two switches of relay K2 close. The lower switch connects the negative terminal of amplifier A3 to ground, which enables transistor Q3 to be supplied (FAULT circuit).
Q3 permits also Q1 to be supplied by means of the upper switch K2. Q1 sends a positive signal, higher than 5.29 V to amplifier A1 input ; transistor Q2 and relay K1 are supplied (FIRE circuit).
NOTE : The 10 kΩ resistor installed upstream of A3 negative input enables an increase in voltage at A1 terminals by means of Q1 and caused by the voltage in FAULT circuit.

F. Test Circuit Used for Maintenance Purpose (Ref. Fig. 006)
In case of fault noted in the operation of a loop, the maintenance personnel can identify the origin of the fault without disconnecting the responders. On the face of the fire detection control unit are installed :
- one rotary selector switch with return in center position
- two pairs of luminescent red and yellow diodes (one pair by loop) :
  YELLOW is for the FAULT circuit and RED for the FIRE circuit (ALARM).

Positioning of the center selector either towards FAULT or ALARM allows discrimination between fire detection control unit faults and fire sensing elements faults.

5. Utilization of Controls and Indicators

A. Fire Warning
- Warning detected by the two loops, LOOP A and LOOP B :
  LOOP TEST/LOOP A/OFF and LOOP TEST/LOOP B/OFF pushbutton switches are pressed in, LOOP A and LOOP B legends come on.




SAMPLE VOLTAGES AT **B**

NORMAL 1.44V FIRE 6.22V
OPEN 1.04V LOOP TEST 6.00V
FAULT TEST 1.14V

INCREASE IN
DETECTOR RESISTANCE
(E.G PRESSURE LOSS)

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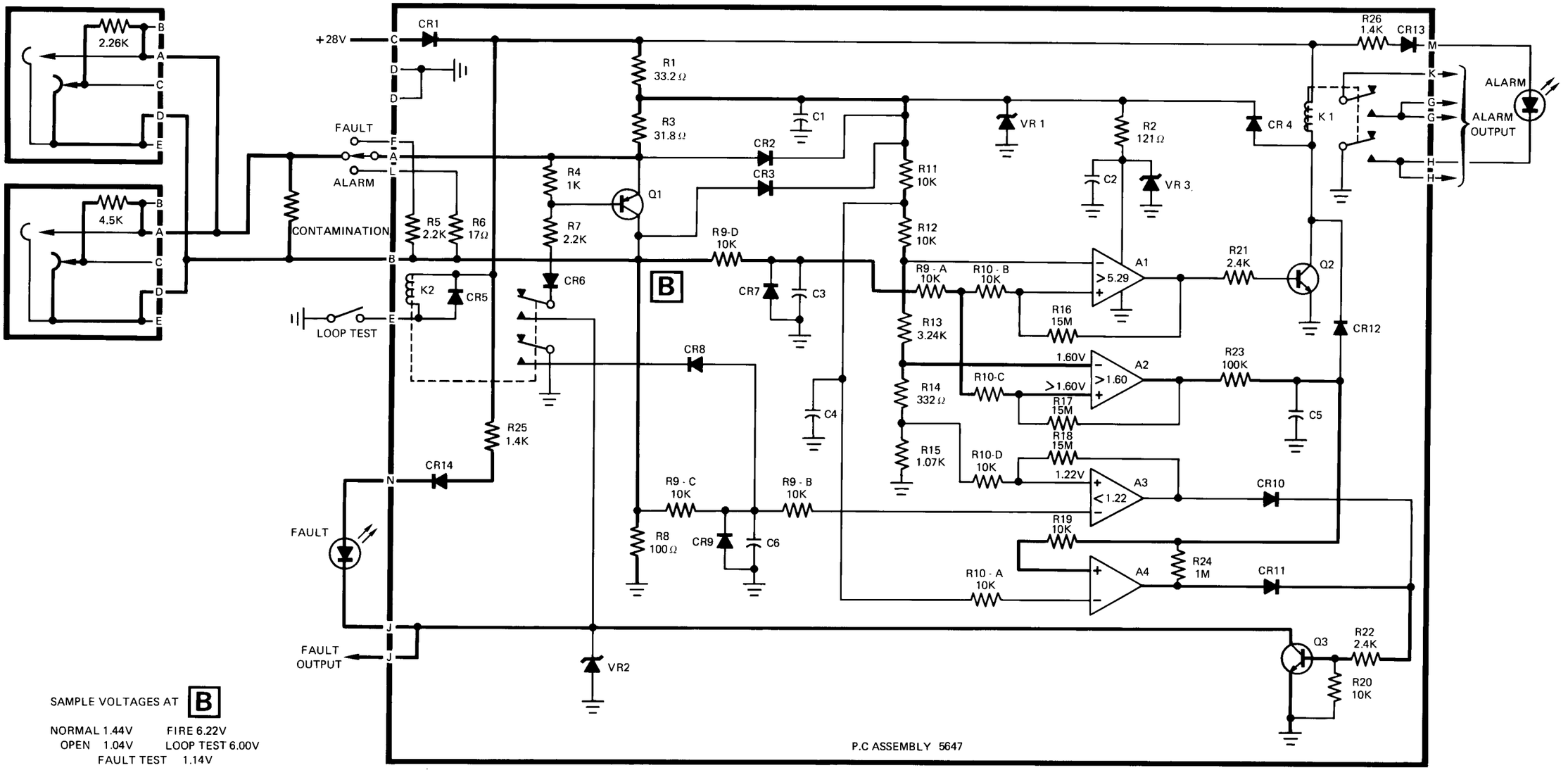
Fire Detection Control Unit - Integrity Fault Configuration
Figure 011




SAMPLE VOLTAGES AT **B**

NORMAL 1.44V FIRE 6.22V
OPEN 1.04V LOOP TEST 6.00V
FAULT TEST 1.14V

CONTAMINATION FAULT
(E.G SHORT CIRCUIT IN
ELECTRICAL CONNECTOR)

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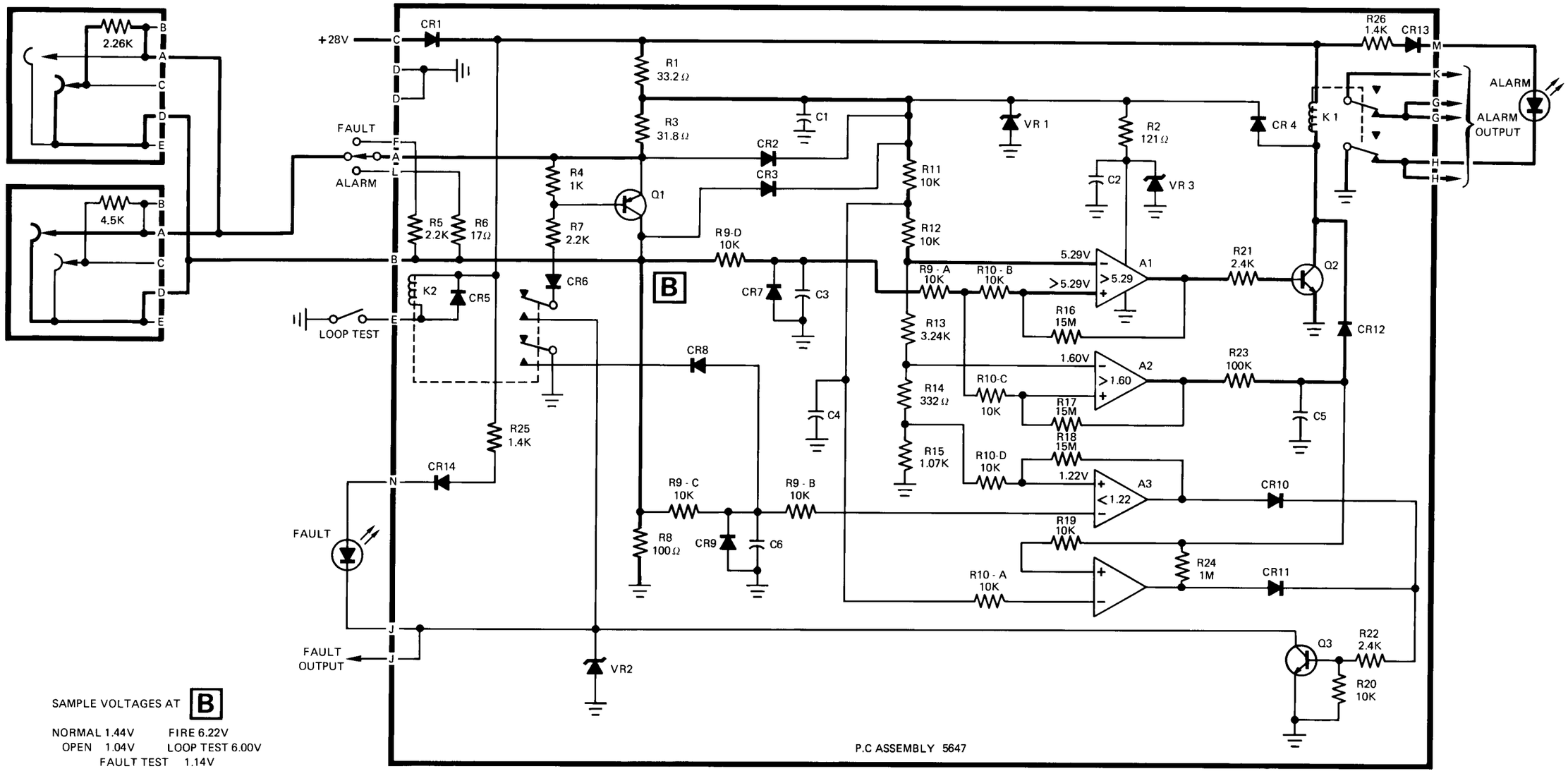
Fire Detection Control Unit - Contamination Configuration
Figure 012




SAMPLE VOLTAGES AT **B**

NORMAL 1.44V FIRE 6.22V
OPEN 1.04V LOOP TEST 6.00V
FAULT TEST 1.14V

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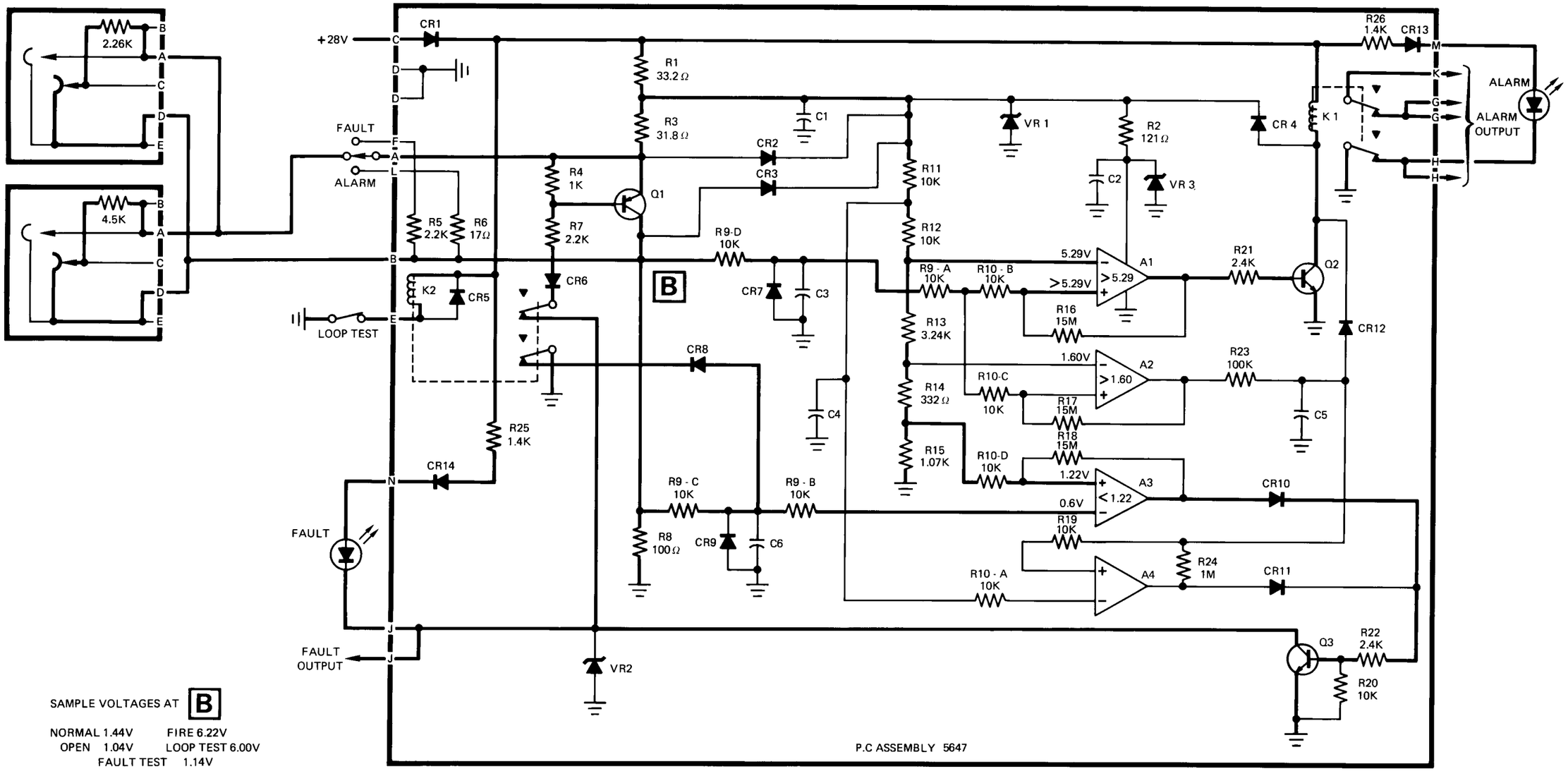
Fire Detection Control Unit - Alarm Fire Configuration
Figure 013




SAMPLE VOLTAGES AT **B**

NORMAL 1.44V FIRE 6.22V
OPEN 1.04V LOOP TEST 6.00V
FAULT TEST 1.14V

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Fire Detection Control Unit - LOOP TEST Configuration
Figure 014

ENG1(2) FIRE red warning light on fire handle comes on.
Red warning light on HP fuel shut off valve control lever comes on to indicate that the valve must be closed.
MASTER WARN light flash on CAPT and F/O main instrument panels 3VU and 5VU and the continous repetitive chime sounds.
ENG FIRE message appears on the L ECAM display unit together with the fire drill instructions.

- Warning detected by only one loop, LOOP A (B) : OFF legend of one of LOOP TEST/LOOP A (B)/OFF pushbutton switch is on ("uniloop" configuration), and on the other pushbutton switch LOOP B (A) legend is on.
  The other warnings are the same as those of a dual loop configuration.

B. Faulty Operation of One Loop
The two LOOP TEST/LOOP A and B/OFF pushbutton switches are pressed in.
- LOOP A (B) legend of the faulty loop comes on.
- MASTER CAUTION lights flash on CAPT and F/O main instrument panels 3VU and 5VU.
- The single chime sounds.

A message appears on the ECAM display unit to confirm the loss of one loop. The detection is carried out by the remaining loop.

C. Exceptional Failure : simultaneous fault of the two loops.
Considering the possible reasons which may cause an indication identical to that of a simultaneous fault and in particular the presence of a torch flame directed towards engine pylon lower section (the most likely hypothesis) it has been decided to proceed with this indication as with a fire warning. Consequently, ENG1(2) FIRE handle integral light will come on and a fire warning will be triggered in case of LOOP A and LOOP B legend simultaneous illumination.

R **ON A/C 001-100,

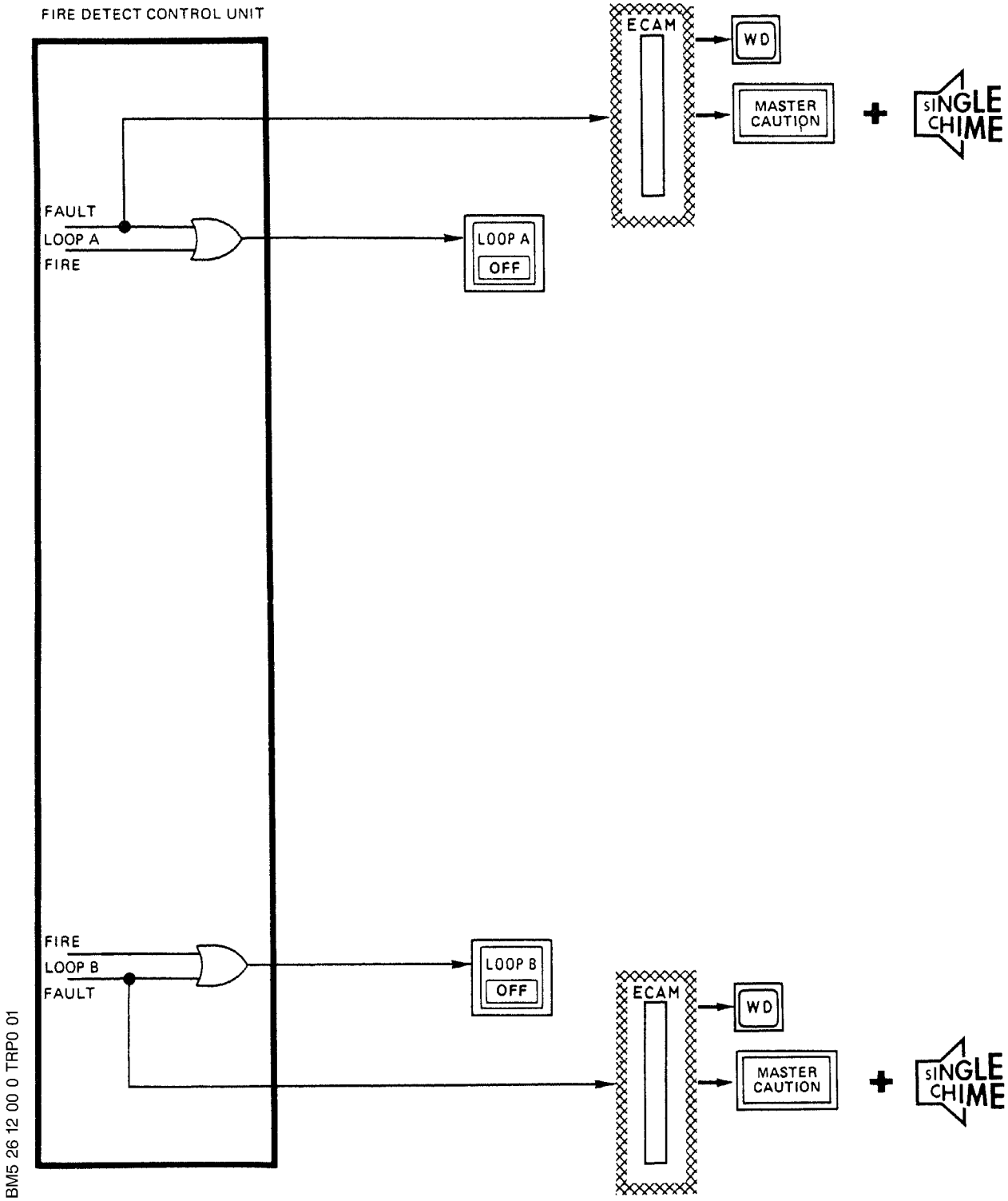
(Ref. Fig. 015)

R **ON A/C 001-100,

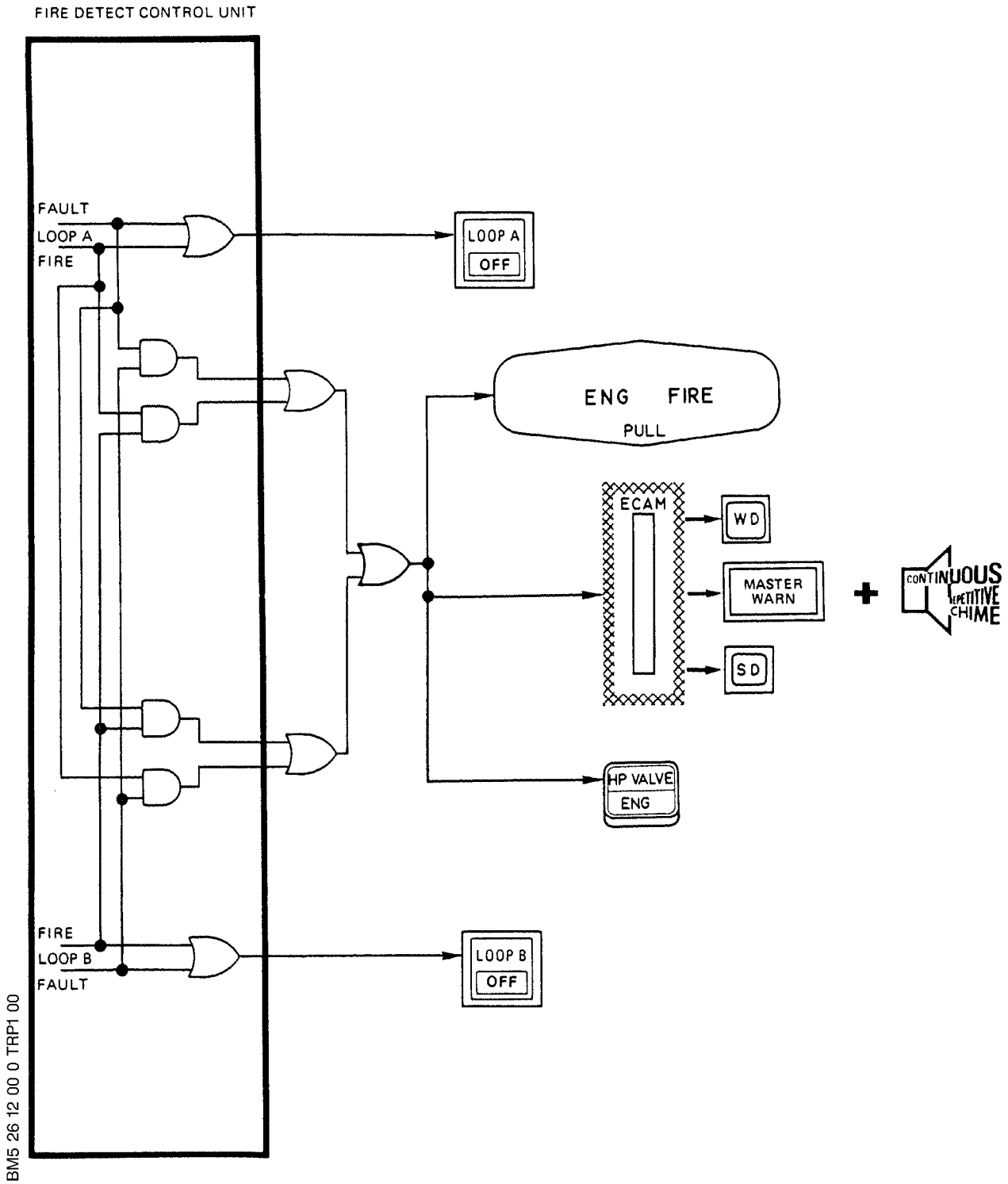
(Ref. Fig. 016)

R **ON A/C 001-100,

D. LOOP TEST Pushbutton Switch
Press LOOP TEST/LOOP A and B pushbutton switches and then press LOOP TEST pushbutton switch for 4 seconds approximately. The following sequence results in :




Fire Detection Indicating - Fault Logic Diagram
Figure 015




Fire Detection Indicating - Fire Logic Diagram
Figure 016

(1)Triggering for 2 seconds of loop **A FAULT** and **FIRE** circuits which causes illumination of **LOOP A** legend.
During and after **1.5** seconds, **MASTER CAUTION** lights flash on **CAPT** and **F/O** main instrument panels **3VU** and **5VU**, the single chime sounds and a message appears on the **ECAM** display unit.

(2)Triggering of loop **A** and **B FAULT** and **FIRE** circuits which causes illumination of **LOOP A** and **LOOP B** legends, fire handle integral light.
**MASTER WARN** lights also flash on **CAPT** and **F/O** main instrument panels **3VU** and **5VU**, the **HP** fuel shut off valve control lever integral light comes on, the repetitive chime sounds and a message appears on the **ECAM** display unit.

(3)When **LOOP TEST** pushbutton switch is released, **FAULT** and **FIRE** circuits of loop **B** are triggered (2 seconds).
During and after **1.5** seconds, **MASTER CAUTION** lights flash on **CAPT** and **F/O** main instrument panels **3VU** and **5VU**, the single chime sounds and a message appears on the **ECAM** display unit.

1. Operational Test

A. Reason for the Job
Loop test and checking of displays.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure

(1)Job Set-up

(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Make certain that electronics racks ventilation is correct.

(c)Close overhead panel circuit breakers, particularly those associated with ECAM, ENGINE FIRE DET, and HP FUEL valve.

(d)On center pedestal 9VU
- place HP fuel shut off valve control lever 1 (2) in ON position.
- check that the red HP VALVE/ENG 1(2) warning light on the lever comes on after 3 seconds.
- place HP fuel shut off valve control lever 1(2) in OFF position.

(2)Test (Loop Test)

| ACTION | RESULT |
|---|---|
| 1. On ENG1 (2) FIRE control module 39WD (40WD) (on overhead panel) | |
| A. Make certain that LOOP A and LOOP B pushbutton switches are pressed (in) | - OFF legends are off. |
| B. Press LOOP TEST pushbutton switch | On control module 39WD (40WD)<br>- LOOP A legend comes on |
| After 2 seconds time delay | On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights come on<br>Aural warning sounds (single chime)<br>On the L ECAM display unit the following message appears.<br>LOOP<br>- ENG1 (2) LOOP A FAULT.....OFF |
| After 1.5 seconds time delay | On control module 39WD (40WD)<br>- LOOP B legend comes on.<br>- Red warning light of ENG1 (ENG2) FIRE handle comes on. |

| ACTION | RESULT |
|---|---|
| | On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights go off<br>- MASTER WARN lights flash<br>- continuous repetitive chime sounds.<br>On the L ECAM display unit a message starting with ENG 1(2) FIRE appears |
| 2. On 9VU | On 9VU |
| A. Place HP fuel shut off valve control lever 1(2) in ON position | - HP VALVE/ENG1 (2) warning light comes on immediately |
| B. Return HP fuel shut off valve control lever 1(2) to OFF position | - HP VALVE/ENG1 (2) warning light goes off |
| 3. On ENG1 (2) FIRE control module 39WD (40WD) | |
| A. Release LOOP TEST pushbutton switch | On control module 39WD (40WD)<br>- LOOP A legend goes off<br>- Red warning light of ENG1 (ENG2) FIRE handle goes off.<br><br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights go off |
| After 2 seconds time delay | On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights come on<br>- Aural warning sounds (single chime)<br>On L ECAM display unit the following message appears<br>- LOOP<br>- ENG1 (2) LOOP B FAULT.....OFF |
| After 1.5 seconds time delay | On control module 39WD (40WD)<br>- LOOP B legend goes off.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights go off<br>On L ECAM display unit, last message disappears. |

(3)Close-Up
(a)Restore system and aircraft to normal operating conditions.

(b)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

R 2. Functional Test

R A. Reason for the Job
R Check warnings associated with fire detection circuits for correct
R operation.

R B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedure | |
| - 24-41-00, P. Block 301 | AC External Power Control |

R C. Procedure
R (1)Job set-up
R (a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
R (b)Make certain that electronics racks ventilation is correct.
R (c)Close overhead panel circuit breakers particularly those
R associated with ENG FIRE DET, ECAM, and HP FUEL valve.
R (d)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | FIRE EXTING/ENG1 & 2 SQUIB B/BTL 1 | 5WE | 207/C19 |
| 22VU | FIRE EXTING/ENG1 & 2 SQUIB B/BTL 2 | 7WE | 207/C20 |
| 133VU | ENGINES/ENG1 & 2/FIRE EXTING/SQUIB A/BTL 1 | 1WE | 335/R71 |
| 133VU | ENGINES/ENG1 & 2/FIRE EXTING/SQUIB A/BTL 2 | 3WE | 335/R72 |
| 133VU | ENGINES/ENG1 & 2/IGNITION/SYS A | 1JH | 334/S72 |
| 133VU | ENGINES/ENG1 & 2/IGNITION/SYS B | 2JH | 333/T72 |
| 133VU | ENGINES/ENG1 & 2/START/CTL & WARN | 1KG | 335/R68 |
| 133VU | ENGINES/ENG2/IGNITION/SYS A | 8JH | 333/T71 |

R (e)On FUEL panel 430VU, make certain that OFF is selected on the four
R ISOL VALVES pushbutton switches.
R (f)On center pedestal 9VU
R - Place HP fuel shut off valve control lever 1(2) in ON position.
R - Check that the red HP VALVE ENG1 (2) warning light on the lever
R comes on after 3 seconds.
R - Place HP fuel shut off valve control lever 1(2) in OFF position.
R (g)On fire handle of ENG1 (ENG2) FIRE control module 39WD (40WD)
R 1 Make certain that ENG1 (ENG2) FIRE handle is in pushed position.
R 2 Make certain that LOOP B pushbutton switch is pressed (in).
R 3 Make certain that LOOP A pushbutton switch is released.
R (h)On CAPT and F/O main instrument panels 3VU and 5VU, MASTER CAUTION
R lights come on and single chime sounds.
R On L ECAM display unit the following message appears.
R LOOP.
R - ENG 1 (2) LOOP A OFF
R (i)On overhead circuit breaker panel 22VU, open ENG FIRE DET ENG1 (2)
R LOOP A circuit breaker 1WD (2WD) (line 209/A19 (A24))

R - The indication does not change
R (2)Extended LOOP test

| ACTION | RESULT |
|---|---|
| 1. On ENG1 (2) FIRE control module 39WD (40WD) | |
| A. Press LOOP TEST pushbutton switch | After 3 seconds delay time<br>On control module 39WD (40WD)<br>- LOOP B legend comes on<br>- Red warning light on ENG1 (ENG2) FIRE handle comes on.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights come on<br>- MASTER CAUTION lights go off.<br>Continuous repetitive chime sounds<br>On L ECAM display unit a message starting with ENG1 (2) FIRE appears<br>On L ECAM display unit<br>- LOOP message disappears when ENG1 (2) FIRE message appears. |
| 2. On panel 9VU | On panel 9VU |
| A. Place HP fuel shut off valve control lever 1(2) in ON position | - HP VALVE ENG1 (2) warning light comes on immediately |
| B. Return HP fuel shut off valve control lever 1(2) to OFF position | - HP VALVE ENG1 (2) warning light goes off |
| 3. On ENG1 (2) control module 39WD (40WD) | |
| A. Release LOOP TEST pushbutton switch | After 3 seconds time delay<br>On control module 39WD (40WD)<br>- LOOP B legend goes off<br>- Red light of ENG1 (ENG2) FIRE handle goes off.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights go off.<br>Continuous repetitive chime stops.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights come on.<br>Single chime sounds.<br>On L ECAM display unit ENG1 (2) message disappears, and following |

| ACTION | RESULT |
|---|---|
| | message appears :<br>- LOOP<br>ENG1 (2) LOOP A OFF. |
| B. Release LOOP B pushbutton switch | On ENG1 (ENG2) FIRE control module 39WD (40WD), on LOOP B pushbutton switch<br>- OFF legend comes on.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights remain on and single chime sounds.<br>On L ECAM display unit, the following message<br>- LOOP<br>ENG1 (2) LOOP A OFF remains<br>ENG1 (2) LOOP B OFF appears |
| C. Press LOOP A pushbutton switch | On control module 39WD (40WD)<br>- OFF legend goes off.<br>On L ECAM display unit, the following message<br>- LOOP<br>ENG1 (2) LOOP B OFF remains<br>ENG1 (2) LOOP A OFF disappears |
| 4. On 22VU, open ENG FIRE DET/ENG1 (2) LOOP B circuit breaker 3WD (4WD) (line 209/A20 (A23)) and close ENG FIRE DET/ENG1 (2) LOOP A circuit breaker 1WD (2WD) (line 209/A19 (A24)) | |
| 5. On control module 39WD (40WD) | |
| A. Press LOOP TEST pushbutton switch | On control module 39WD (40WD)<br>- LOOP A legend comes on<br>- ENG1 (ENG2) FIRE handle warning light comes on<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights come on.<br>- MASTER CAUTION lights go off.<br>On L ECAM display unit :<br>LOOP<br>ENG1 (2) LOOP B OFF message disappears and message starting with ENG1 (2) FIRE appears.<br>- Continuous repetitive chime sounds. |

| ACTION | RESULT |
|---|---|
| 6. On panel 9VU | On panel 9VU |
| A. Place HP fuel shut off valve control lever 1(2) in ON position | - HP VALVE ENG1 (2) warning light comes on immediately |
| B. Return HP fuel shut off valve control lever 1(2) to OFF position | - HP VALVE ENG1 (2) warning light goes off |
| 7. On ENG 1(2) control module 39WD (40WD) | |
| A. Release LOOP TEST pushbutton switch | On control module 39WD (40WD)<br>- LOOP A legend goes off<br>- ENG1 (ENG2) FIRE handle warning light goes off<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights go off.<br>Aural warning stops.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights come on.<br>Single chime sounds.<br>On L ECAM display unit<br>- ENG1 (2) FIRE message disappears and the following message appears :<br>LOOP<br>ENG1 (2) LOOP B OFF. |
| B. Press LOOP B pushbutton switch | On control module 39WD (40WD)<br>- OFF legend goes off.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights go off.<br>On L ECAM display unit, last message disappears. |

8. On circuit breaker panels, close the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | ENG FIRE DET/ENG1/LOOP B | 3WD | 209/A20 |
| 22VU | ENG FIRE DET/ENG2/LOOP B | 4WD | 209/A23 |
| 22VU | FIRE EXTING - ENG1 & 2 SQUIB B BTL 1 | 5WE | 207/C19 |
| 22VU | FIRE EXTING - ENG1 & 2 SQUIB B BTL 2 | 7WE | 207/C20 |
| 133VU | ENGINES/ENG1 & 2/FIRE EXTING/SQUIB A/ BTL 1 | 1WE | 335/R71 |

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 133VU | ENGINES/ENG1 & 2/FIRE EXTING/SQUIB A/ BTL 2 | 3WE | 335/R72 |

| ACTION | RESULT |
|---|---|
| 9. On ENG 1(2) control module 39WD (40WD) | |
| A. Pull ENG1 (ENG2) FIRE handle. | On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights come on<br>On control module 39WD (40WD)<br>- Both SQUIB legends come on |
| B. Press LOOP TEST pushbutton switch | On control module 39WD (40WD)<br>- LOOP A and LOOP B legends remain off<br>- ENG1 (2) FIRE handle warning light comes on.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights flash.<br>On L ECAM display unit, following message is displayed :<br>- ENG1 (2) FIRE |
| 10.On ENG 1(2) FIRE control module 39WD (40WD) | |
| A. Release LOOP TEST pushbutton switch | On control module 39WD (40WD)<br>- ENG1 (2) FIRE handle warning light goes off. |
| B. Push ENG1 (ENG2) FIRE handle | On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights go off.<br>On L ECAM display unit, message is cleared.<br>On control module 39WD (40WD)<br>- Both SQUIB legends go off. |

(3)BITE Test
(a)on ENG1 (ENG2) FIRE control module 39WD (40WD)
1 Make certain that ENG1 (ENG2) FIRE handle is in pushed position.
2 Press LOOP A and LOOP B pushbutton switches.
(b)On FUEL panel 430VU, make certain that OFF is selected on the four ISOL VALVES pushbutton switches.
(c)On center pedestal 9VU

- place HP fuel shut off valve control lever 1(2) in ON position
- check that the red HP VALVE ENG1(2) warning light on the lever comes on after 3 seconds.
- place HP fuel shut off valve control lever 1(2) in OFF position.

(d)Perform test as follows.

| ACTION | RESULT |
|---|---|
| 1. In avionics compartment shelf 96VU, on fire detection control unit 11WD (12WD) | |
| A. Place selector switch in ALARM position | On control unit 11WD (12WD) :<br>- ALARM warning lights come on.<br>On control module 39WD (40WD) :<br>- warning light of ENG1 (ENG2) FIRE handle comes on.<br>- LOOP A and LOOP B legends come on<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights come on.<br>On L ECAM display unit, the following message is displayed :<br>- ENG1 (ENG2) FIRE<br>Continuous repetitive chime sounds |
| 2. On center pedestal 9VU | On panel 9VU |
| A. Place HP fuel shut off valve control lever 1(2) in ON position | - HP VALVE ENG1 (2) warning light comes on immediately |
| B. Return HP fuel shut off valve control lever 1(2) to OFF position. | - HP VALVE ENG1 (2) warning light goes off |
| 3. In avionics compartment, shelf 96VU, on fire detection control unit 11WD(12WD) | |
| A. Place control unit selector switch in center position | On control unit 11WD (12WD) :<br>- ALARM warning lights go off.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights go off<br>On L ECAM display unit,<br>- the last message disappears<br>Aural warning stops.<br>On control module 39WD (40WD) :<br>- ENG1 (2) FIRE handle warning light goes off<br>- LOOP A and LOOP B legends go off. |
| B. Place control unit selector switch in FAULT position | On control unit 11WD (12WD)<br>- FAULT warning light comes on. |

| ACTION | RESULT |
|---|---|
| | On control module 39WD (40WD)<br>- integral red light of ENG 1 (2) FIRE handle comes on<br>- LOOP A & LOOP B legends come on.<br>On CAPT and F/O main instrument panels 3VU and 5VU :<br>- MASTER WARN lights come on.<br>On L ECAM display unit, the following message is displayed :<br>- ENG1 (ENG2) FIRE.<br>Continuous repetitive chime sounds. |
| 4. On center pedestal 9VU | On panel 9VU |
| A. Place HP fuel shut off valve control lever 1(2) in ON position | - HP VALVE ENG1 (2) warning light comes on immediately |
| B. Return HP fuel shut off valve control lever 1(2) to OFF position | - HP VALVE ENG1 (2) warning light goes off |
| 5. In avionics compartment, shelf 96VU, on fire detection control unit 11WD (12WD) | |
| A. Place control unit selector switch in center position | On control unit 11WD (12WD)<br>- FAULT warning light goes off.<br>On control module 39WD (40WD)<br>- all warning lights go off.<br>On CAPT and F/O main instrument panels 3VU and 5VU.<br>- MASTER CAUTION and MASTER WARN lights go off.<br>On L ECAM display unit<br>- last message disappears.<br>Aural warning stops. |

(4)Close-up
(a)Close circuit breakers previously opened.
(b)Restore system and aircraft to normal operating conditions.
- Release LOOP A and LOOP B pushbutton switches : OFF legends come on.
(c)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301)

R 3. Continuity and Electrical Resistance Test

R A. Reason for the Job
R - To check that after removal/installation of a component, ENG FIRE
R detection system operates correctly.

R B. Equipment and Materials

| R ITEM | DESIGNATION |
|---|---|
| R (1) | Ohmmeter, 1 % precision or better |
| R (2) | Megohmmeter |
| R (3) | Access Platform |
| R (4) | Circuit Breaker Safety Clips |
| R Referenced Procedures | |
| R - 26-12-12, P. Block 401 | Fire Sensing Elements |
| R - 71-13-00, P. Block 301 | Cowl Doors |

R C. Procedure
R (1)Job set-up
R (a)Position access platform at FWD cargo compartment door.
R (b)Open safety and tag the circuit breaker for the appropriate engine
R and open thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
R (c)Open avionics compartment access door 132AZ.
R (d)Open safety and tag the following circuit breakers :

| R PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| R 22VU | ENG FIRE DET/ENG1/LOOP A | 1WD | 209/A19 |
| R 22VU | ENG FIRE DET/ENG2/LOOP A | 2WD | 209/A24 |
| R 22VU | ENG FIRE DET/ENG1/LOOP B | 3WD | 209/A20 |
| R 22VU | ENG FIRE DET/ENG2/LOOP B | 4WD | 209/A23 |
| R 22VU | ENG FIRE DET/ENG1/WARN | 5WD | 209/A21 |
| R 22VU | ENG FIRE DET/ENG2/WARN | 6WD | 209/A22 |

(2)Continuity Test
WARNING : DO NOT DISCONNECT CONNECTORS WITHOUT CIRCUIT BREAKERS 1WD(2WD),
3WD(4WD), 5WD(6WD) BEING OPENED AND SAFETIED.
R CAUTION : THE VOLTAGE APPLIED BETWEEN PINS (PIN-TO-PIN) MUST NOT BE MORE
R THAN 75 VOLTS DC. THE VOLTAGE APPLIED BETWEEN PINS AND CASE
R (PIN-TO-CASE) MUST NOT BE MORE THAN 325 VOLTS DC.
(a)In ENG1(2) core area
1 Disconnect electrical connectors DH1, DH2, DH3 and DH4.
2 Check continuity between the following pins:

| ACTION | RESULT |
|---|---|
| Pin A to B | Less than 1 ohm |
| Pin C to D | Less than 1 ohm |
| Pin D to E | Less than 1 ohm |
| Pin A to C | Between 4365 and 4635 ohms |
| Pin A to D | Between 4365 and 4635 ohms |

| ACTION | RESULT |
|---|---|
| Pin B to C | Between 4365 and 4635 ohms |

(b)In ENG 1(2) pylon area
1 Disconnect plug 1911VC(1910VC) for sensing element 23WD(22WD) and plug 1909VC(1908VC) for sensing element 27WD(26WD).
2 Using an ohmmeter, check the resistance values for loop A and loop B between the following pins :

| ACTION | RESULT |
|---|---|
| Pin N to M | 4500 ± 135 ohms |

NOTE : If the ohmmeter indications are not the values listed above, replace sensing elements (Ref. 26-12-12, P. Block 401).

(3)Insulation resistance test :

R (a)Check open circuit between metal case and each pin :
R - Measure the resistance between each connector pin (A thru E) and the detector case. The resistance must not be less than 20 megohms (open circuit) at each pin.

R (4)Close-up
R (a)Connect electrical connectors DH1, DH2, DH3 and DH4 and plugs 1911VC(1910VC) and 1909VC(1908VC).
R (b)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
R (c)Remove safety clips and tags and close circuit breakers.
R (d)Close access doors 132AZ.
R (e)Remove access platform at FWD cargo compartment door.
R (f)Close thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
R (g)Carry out the operational test (Refer. to Para. 1.).

1. Operational Test

A. Reason for the Job
Loop test and checking of displays.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure

(1)Job set-up

(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Make certain that electronics racks ventilation is correct.

(c)Close overhead panel circuit breakers, particularly those associated with ECAM, ENGINE FIRE DET, and HP FUEL valve.

(d)On center pedestal 9VU
- place HP fuel shut off valve control lever 1 (2) in ON position
- check that the red HP VALVE/ENG 1(2) warning light on the lever comes on after 3 seconds
- place HP fuel shut off valve control lever 1(2) in OFF position.

(2)Test (Loop Test)

| ACTION | RESULT |
|---|---|
| 1. On ENG1(2) FIRE control module 39WD (40WD) (on overhead panel) | |
| A. Make certain that LOOP A and LOOP B pushbutton switches are pressed (in) | - OFF legends are off. |
| B. Press LOOP TEST pushbutton switch | On control module 39WD (40WD)<br>- LOOP A legend comes on |
| After 2 seconds time delay | On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights come on<br>Aural warning sounds (single chime)<br>On the L ECAM display unit the following message appears.<br>LOOP<br>- ENG1(2) LOOP A FAULT.....OFF |
| After 1.5 seconds time delay | On control module 39WD (40WD)<br>- LOOP B legend comes on.<br>- Red warning light of ENG1 (ENG2) FIRE handle comes on. |

| ACTION | RESULT |
|---|---|
| | On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights go off<br>- MASTER WARN lights flash<br>- Continuous repetitive chime sounds.<br>On the L ECAM display unit a message starting with ENG 1(2) FIRE appears. |
| 2. On 9VU | On 9VU |
| A. Place HP fuel shut off valve control lever 1(2) in ON position | - HP VALVE/ENG 1(2) warning light comes on immediately |
| B. Return HP fuel shut off valve control lever 1(2) to OFF position | - HP VALVE/ENG 1(2) warning light goes off. |
| 3. On ENG 1(2) FIRE control module 39WD(40WD) | On ENG 1(2) FIRE control module 39WD(40WD) |
| A. Release LOOP TEST pushbutton switch | - LOOP A legend goes off<br>- Red warning light of ENG1 (ENG2) FIRE handle goes off.<br><br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights go off |
| After 2 seconds time delay | On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights come on<br>- Aural warning sounds (single chime)<br>On L ECAM display unit the following message appears<br>- LOOP<br>- ENG1(2) LOOP B FAULT.....OFF |
| After 1.5 seconds time delay | On control module 39WD (40WD)<br>- LOOP B legend goes off.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights go off<br>On L ECAM display unit, last message disappears. |

(3)Close-Up
(a)Restore system and aircraft to normal operating condition.
(b)De-energize the aircraft electrical network (Ref. 24-41-00,

P. Block 301).

2. Functional Test

A. Reason for the Job
Check warnings associated with fire detection circuits for correct operation.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure
(1)Job set-up
(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that electronics racks ventilation is correct.
(c)Close overhead panel circuit breakers particularly those associated with ENG FIRE DET, ECAM and HP FUEL valve.
(d)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | FIRE EXTING/ENG1 & 2 SQUIB B/BTL 1 | 5WE | 207/C19 |
| 22VU | FIRE EXTING/ENG1 & 2 SQUIB B/BTL 2 | 7WE | 207/C20 |
| 133VU | ENGINES/ENG1 & 2/FIRE EXTING/SQUIB A/BTL 1 | 1WE | 335/R71 |
| 133VU | ENGINES/ENG1 & 2/FIRE EXTING/SQUIB A/BTL 2 | 3WE | 335/R72 |
| 133VU | ENGINES/ENG1 & 2/IGNITION/SYS A | 1JH | 334/S72 |
| 133VU | ENGINES/ENG1 & 2/IGNITION/SYS B | 2JH | 333/T72 |
| 133VU | ENGINES/ENG1 & 2/START/CTL & WARN | 1KG | 335/R68 |

(e)On FUEL panel 430VU, make certain that OFF is selected on the four ISOL VALVES pushbutton switches.
(f)On center pedestal 9VU,
- place HP fuel shut off valve control lever 1(2) in ON position
- check that the red HP VALVE ENG 1(2) warning light on the lever comes on after 3 seconds
- place HP fuel shut off valve control lever 1(2) in OFF position.

(g)On fire handle of ENG1 (ENG2) FIRE control module 39WD (40WD)
1 Make certain that ENG1 (ENG2) FIRE handle is in pushed position.
2 Make certain that LOOP B pushbutton switch is pressed (in).
3 Make certain that LOOP A pushbutton switch is released.
(h)On CAPT and F/O main instrument panels 3VU and 5VU, MASTER CAUTION lights come on and single chime sounds.
On L ECAM display unit the following message appears.
LOOP.
- ENG 1 (2) LOOP A OFF
(i)On overhead circuit breaker panel 22VU, open ENG FIRE DET ENG1(2) LOOP A circuit breaker 1WD (2WD) (line 209/A19 (A24))
- The indication does not change

(2)Extended LOOP test

| ACTION | RESULT |
|---|---|
| 1. On ENG1(2) FIRE control module 39WD (40WD) | |
| A. Press LOOP TEST pushbutton switch | After 3 seconds delay time<br>On control module 39WD (40WD)<br>- LOOP B legend comes on<br>- Red warning light on ENG1 (ENG2) FIRE handle comes on.<br><br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights come on<br>- MASTER CAUTION lights go off.<br>Continuous repetitive chime sounds<br>On L ECAM display unit a message starting with ENG1(2) FIRE appears<br>On L ECAM display unit<br>- LOOP message disappears when ENG1 (2) FIRE message appears. |
| 2. On panel 9VU | On panel 9VU |
| A. Place HP fuel shut off valve control lever 1(2) in ON position | - HP VALVE/ENG 1(2) warning light comes on immediately |
| B. Return HP fuel shut off valve control lever 1(2) to OFF position | - HP VALVE/ENG 1(2) warning light goes off. |
| 3. On ENG1(2) control module 39WD(40WD) | |
| A. Release LOOP TEST pushbutton switch | After 3 seconds time delay<br>On control module 39WD (40WD)<br>- LOOP B legend goes off<br>- Red light of ENG1 (ENG2) FIRE handle goes off.<br><br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights go off.<br>Continuous repetitive chime stops<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights come on. |

| ACTION | RESULT |
|---|---|
| | Single chime sounds.<br>On L ECAM display unit ENG 1(2) message disappears, and following message appears :<br>- LOOP<br>ENG 1 (2) LOOP A OFF. |
| B. Release LOOP B pushbutton switch | On ENG1 (ENG2) FIRE control module 39WD (40WD), on LOOP B pushbutton switch<br>- OFF legend comes on.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights remain on and single chime sounds.<br>On L ECAM display unit, the following message<br>- LOOP<br>ENG1 (2) LOOP A OFF remains<br>ENG1 (2) LOOP B OFF appears |
| C. Press LOOP A pushbutton switch | On control module 39WD (40WD)<br>- OFF legend goes off.<br>On L ECAM display unit, the following message<br>- LOOP<br>ENG1 (2) LOOP B OFF remains<br>ENG1 (2) LOOP A OFF disappears |
| 4. On 22VU, open ENG FIRE DET/ENG1(2) LOOP B circuit breaker 3WD (4WD) (line 209/A20 (A23)) and close ENG FIRE DET/ENG1 (2) LOOP A circuit breaker 1WD (2WD) (line 209/A19 (A24)) | |
| 5. On control module 39WD (40WD) | |
| A. Press LOOP TEST pushbutton switch | On control module 39WD (40WD)<br>- LOOP A legend comes on<br>- ENG1 (ENG2) FIRE handle warning light comes on<br><br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights come on.<br>- MASTER CAUTION lights go off.<br>On L ECAM display unit :<br>LOOP |

| ACTION | RESULT |
|---|---|
| | ENG1 (2) LOOP B OFF message disappears and message starting with ENG1 (2) FIRE appears.<br>- Continuous repetitive chime sounds. |
| 6. On panel 9VU | On panel 9VU |
| A. Place HP fuel shut off valve control lever 1(2) in ON position | - HP VALVE/ENG 1(2) warning light comes on immediately |
| B. Return HP fuel shut off valve control lever 1(2) to OFF position | - HP VALVE/ENG 1(2) warning light goes off |
| 7. On ENG 1(2) control module 39WD(40WD) | |
| A. Release LOOP TEST pushbutton switch | On control module 39WD (40WD)<br>- LOOP A legend goes off<br>- ENG1 (ENG2) FIRE handle warning light goes off<br><br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights go off.<br>Aural warning stops.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights come on.<br>Single chime sounds.<br>On L ECAM display unit<br>- ENG1 (2) FIRE message disappears and the following message appears :<br>LOOP<br>ENG1 (2) LOOP B OFF. |
| B. Press LOOP B pushbutton switch | On control module 39WD (40WD)<br>- OFF legend goes off.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights go off.<br>On L ECAM display unit, last message disappears. |
| 8. On circuit breaker panels, close the following circuit breakers : | |

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | ENG FIRE DET/ENG1/LOOP B | 3WD | 209/A20 |
| 22VU | ENG FIRE DET/ENG2/LOOP B | 4WD | 209/A23 |
| 22VU | FIRE EXTING - ENG1 & 2 SQUIB B BTL 1 | 5WE | 207/C19 |
| 22VU | FIRE EXTING - ENG1 & 2 SQUIB B BTL 2 | 7WE | 207/C20 |
| 133VU | ENGINES/ENG1 & 2/FIRE EXTING/SQUIB A/ BTL 1 | 1WE | 335/R71 |
| 133VU | ENGINES/ENG1 & 2/FIRE EXTING/SQUIB A/ BTL 2 | 3WE | 335/R72 |

| ACTION | RESULT |
|---|---|
| 9. On ENG1(2) control module 39WD(40WD) | |
| A. Pull ENG1 (ENG2) FIRE handle. | On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights come on<br>On control module 39WD (40WD)<br>- Both SQUIB legends come on |
| B. Press LOOP TEST pushbutton switch | On control module 39WD (40WD)<br>- LOOP A and LOOP B legends remain off<br>- ENG1 (2) FIRE handle warning light comes on.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights flash.<br>On L ECAM display unit, following message is displayed :<br>- ENG1 (2) FIRE |
| 11.On ENG 1(2) control module 39WD(40WD) | |
| A. Release LOOP TEST pushbutton switch | On control module 39WD (40WD)<br>- ENG1 (2) FIRE handle warning light goes off. |
| B. Push ENG1 (ENG2) FIRE handle | On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights go off.<br>On L ECAM display unit, message is cleared.<br>On control module 39WD (40WD)<br>- Both SQUIB legends go off. |

(3)BITE Test

(a)on ENG1 (ENG2) FIRE control module 39WD (40WD)
1 Make certain that ENG1 (ENG2) FIRE handle is in pushed position.
2 Press LOOP A and LOOP B pushbutton switches.
(b)On fuel panel 430VU, make certain that OFF is selected on the four ISOL VALVES pushbutton switches.
(c)On center pedestal 9VU
- place HP fuel shut off valve control lever 1(2) in ON position
- check that the red HP VALVE ENG 1(2) warning light on the lever comes on after 3 seconds.
- place HP fuel shut off valve control lever 1(2) in OFF position.
(d)Perform test as follows

| ACTION | RESULT |
|---|---|
| 1. In avionics compartment shelf 96VU, on fire detection control unit 11WD (12WD) | |
| A. Place selector switch in ALARM position | On control unit 11WD (12WD) :<br>- ALARM warning lights come on.<br>On control module 39WD (40WD) :<br>- warning light of ENG1 (ENG2) FIRE handle comes on.<br>- LOOP A and LOOP B legends come on<br><br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights come on.<br>On L ECAM display unit, the following message is displayed :<br>- ENG1 (ENG2) FIRE.<br>Continuous repetitive chime sounds |
| 2. On panel 9VU | On panel 9VU |
| A. Place HP fuel shut off valve control lever 1(2) in ON position | - HP VALVE ENG1 (2) warning light comes on immediately |
| B. Return HP fuel shut off valve control lever 1(2) to OFF position. | - HP VALVE ENG1 (2) warning light goes off |
| 3. On control unit 11WD (12WD) | |
| A. Place control unit selector switch In center position | On control unit 11WD (12WD) :<br>- ALARM warning lights go off.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights go off<br>On L ECAM display unit :<br>- the last message disappears |

| ACTION | RESULT |
|---|---|
| | Aural warning stops.<br>On control module 39WD (40WD) :<br>- ENG1(2) FIRE handle warning light goes off<br>- LOOP A and LOOP B legends go off. |
| B. Place control unit selector switch in FAULT position | On control unit 11WD (12WD)<br>- FAULT warning light comes on.<br>On control module 39WD (40WD)<br>- integral red light of ENG 1 (2) FIRE handle comes on<br>- LOOP A & LOOP B legends come on.<br><br>On CAPT and F/O main instrument panels 3VU and 5VU :<br>- MASTER WARN lights come on.<br>On L ECAM display unit, the following message is displayed :<br>- ENG1 (ENG2) FIRE.<br>Continuous repetitive chime sounds. |
| 4. On panel 9VU | On panel 9VU |
| A. Place HP fuel shut off valve control lever 1(2) in ON position | - HP VALVE ENG1 (2) warning light comes on immediately |
| B. Return HP fuel shut off valve control lever 1(2) to OFF position. | - HP VALVE ENG1 (2) warning light goes off |
| 5. On control unit 11WD (12WD) | |
| A. Place control unit selector switch in center position | On control unit 11WD (12WD)<br>- FAULT warning light goes off.<br>On control module 39WD (40WD)<br>- all warning lights go off.<br><br>On CAPT and F/O main instrument panels 3VU and 5VU.<br>- MASTER CAUTION and MASTER WARN lights go off.<br>On L ECAM display unit<br>- The last message disappears.<br>Aural warning stops. |

(4)Close-up

(a)Restore system and aircraft to normal operating condition.
(b)De-energize the aircraft electrical network (Ref. 24-41-00,

P. Block 301).

## ENGINE FIRE DETECTION CONTROL UNIT - REMOVAL/INSTALLATION

NOTE : Removal/Installation procedures of the two engine fire detection control units (11WD and 12WD) are identical.

### 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| Referenced Procedure<br>- 26-12-00, P. Block 501 | Engine Fire and Overheat Detection |

### 2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | ENG FIRE DET/ENG1/LOOP A | 1WD | 209/A19 |
| 22VU | ENG FIRE DET/ENG2/LOOP A | 2WD | 209/A24 |
| 22VU | ENG FIRE DET/ENG1/LOOP B | 3WD | 209/A20 |
| 22VU | ENG FIRE DET/ENG2/LOOP B | 4WD | 209/A23 |
| 22VU | ENG FIRE DET/ENG1/WARN | 5WD | 209/A21 |
| 22VU | ENG FIRE DET/ENG2/WARN | 6WD | 209/A22 |

(2)Open door 121BL for access to avionics compartment.

(3)Remove side panel (on same side as access door 132AZ) of shelf 96VU (zone 122) in which electronic smoke detection control unit (9WA) is located.

B. Removal

(Ref. Fig. 401)

(1)Disconnect electrical plug (1).

(2)Loosen and remove screws (4) and washers (3) from mounting lugs (2) used for attaching unit to its mount.

(3)Remove unit from its mount.

C. Preparation of Replacement Component

(1)Remove protective cap from electrical receptacle

(2)Carry out a visual check of engine fire detection control unit.

D. Installation (Ref. Fig. 401)

(1)Position control unit on its mount, holding it in order to place the mounting lugs (2) in front of the captive nuts (5).

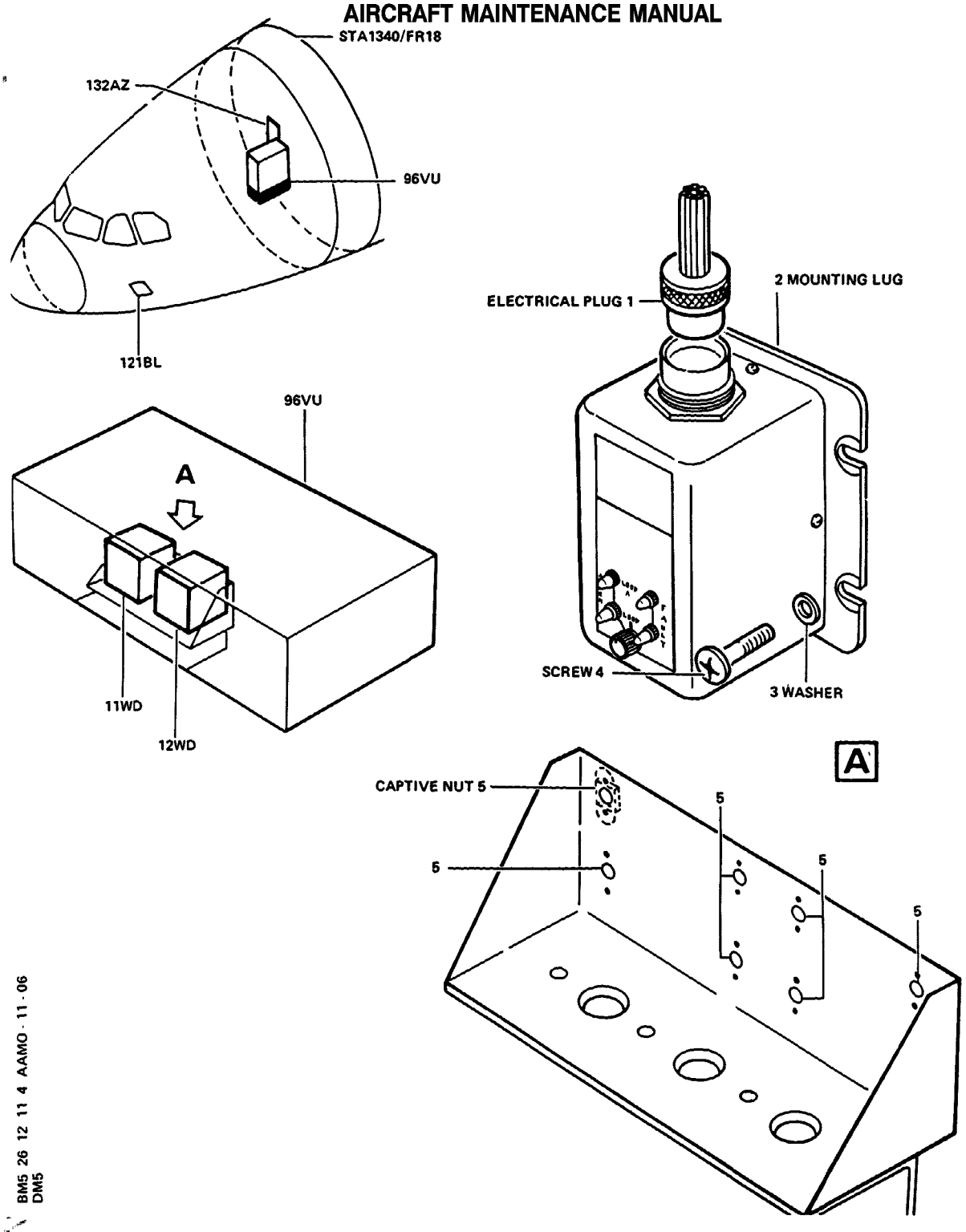
(2)Insert screws (4) with washers (3) in each of the four captive nuts (5) and tighten.

(3)Connect electrical plug (1).

E. Test

(1)Carry out a functional test

- BITE test (Ref. 26-12-00, P. Block 501)




Engine Fire Dectection Control Unit
Figure 401

F. Close-Up
(1)Make certain that shelf 96VU and working area are clean and clear of tools and miscellaneous items of equipment.
(2)Clean working area if necessary.
(3)Install side panel on shelf 96VU.
(4)Close door 121BL.
(5)Make certain that circuit breakers 1WD, 2WD, 3WD, 4WD, 5WD and 6WD are closed.

R 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Corrosion - Resistant Steel Lockwire Dia 0.5 mm (0.020 in.) |
| Referenced Procedures | |
| - 71-13-00, P. Block 301 | Cowl Doors |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 20-21-12, P. Block 1 | Tightening Torques |
| - 71-70-51, P. Block 401 | Engine Drain Line |
| - 26-12-00, P. Block 501 | Engine Fire and Overheat Detection |

2. Procedure

A. Job Set-Up
(1)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)Position access platforms.
(3)Open engine cowl doors (Ref. 71-13-00, P. Block 301).
(4)Open, safety and tag the following circuit breakers.

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | ENG FIRE DET/ENG 1/LOOP A | 1WD | 209/A19 |
| 22VU | ENG FIRE DET/ENG 2/LOOP A | 2WD | 209/A24 |
| 22VU | ENG FIRE DET/ENG 1/LOOP B | 3WD | 209/A20 |
| 22VU | ENG FIRE DET/ENG 2/LOOP B | 4WD | 209/A23 |
| 22VU | ENG FIRE DET/ENG 1/WARN | 5WD | 209/A21 |
| 22VU | ENG FIRE DET/ENG 2/WARN | 6WD | 209/A22 |

(5)Remove harness support so that harness can be stowed on one side.
NOTE : All attachment hardware is re-used.
(6)Remove drain line (right side of engine) (Ref. 71-70-51, P. Block 401)
(7)If necessary, remove fire shield (protecting hydraulic and fuel lines, right side of engine).

B. Removal of Support Tube and Sensing Element Assembly from Pylon.
NOTE : Removal procedure is identical for each engine.
(Ref. Fig. 401)
(1)Disconnect electrical connectors :
- for connector (1) from Loop A, 23WD (22WD) on ENG1 (ENG2), disconnect plug 1911VC (1910VC).
- for connector (2) from Loop B, 27WD (26WD) on ENG1 (ENG2), disconnect plug 1909VC (1908VC).

(2)Remove nut (11), bolt (12) and washer (13).
(3)Remove bolts (4) and washers (5).
(4)Remove nut (8), bolt (9) and washer (10).

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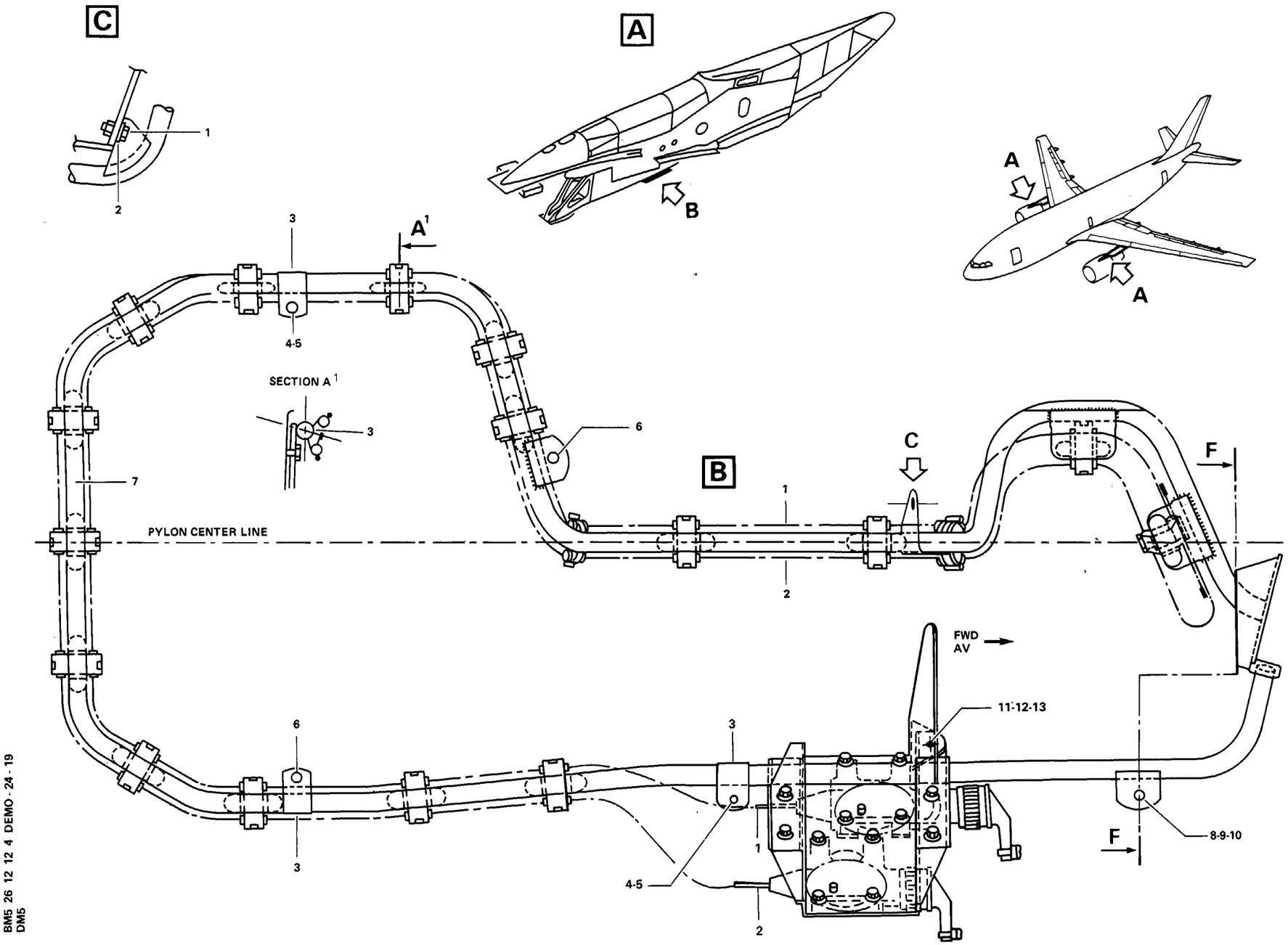


Pylon Sensing Element Assembly
Figure 401

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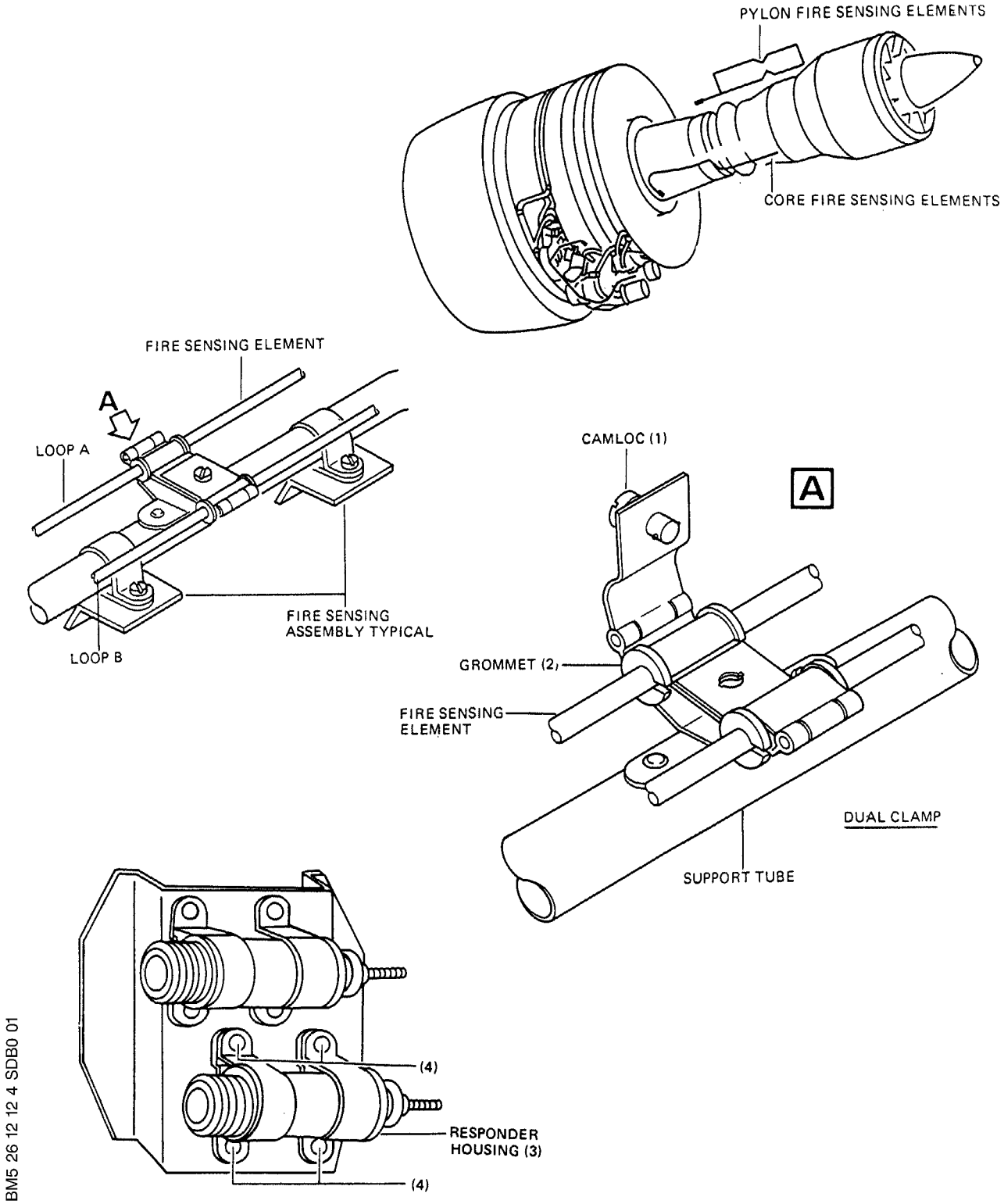
(5)Remove nuts (6) while holding support bracket (7).
(6)Remove support bracket (7).

C. Removal of Sensing Element from Support Tube
R (Ref. Fig. 402)
(1)Untighten camlocs (1) and open dual clamps to free grommets supporting the sensing element to be removed.
(2)Remove bolts (4) from the two clamps securing responder housing (3) to the plate.
(3)Remove fire sensing element and retain grommets (2) and hardware.

D. Preparation of Replacement Component
(1)Visually inspect :
(a)Sensing element
(b)Support tube and attachment clamps.
(2)Install grommets (2) on replacement component.

E. Installation of Sensing Element on Support Tube (Ref. Fig. 402)
(1)Position sensing element.
(2)Attach responder (3) on support plate by means of two clamps.
CAUTION : SENSING ELEMENT SHOULD BE INSTALLED FREE OF TENSION ESPECIALLY NEAR THE RESPONDER AS SEVERAL BREAKAGES HAVE OCCURRED IN SERVICE PROBABLY DUE SENSOR MISHANDLING AND INSTALLATION WITHOUT PROPER ALIGNMENT TO THE FIRST SENSOR CLAMP.
(3)Install each grommet on its dual clamp, close clamps and tighten camlocs (1).
(4)Adjust responder housing positioning on the plate, if necessary.
(5)On the full length of the sensing elements make certain that :
(a)Distance between the two sensing elements installed on same support is not less than 15 mm,
(b)Distance between sensing elements and support is more than 6 mm.

F. Installation of Support Tube and Sensing Element Assembly on Pylon
WARNING : MAKE CERTAIN THAT THE CIRCUIT BREAKERS CONCERNED ARE OPEN BEFORE ATTEMPTING THE INSTALLATION PROCEDURE.
NOTE : Installation procedure is identical for each engine.
(Ref. Fig. 401)
(1)Position the support bracket (7).
(2)Install nuts (6) and tighten.
(3)Install washer (10), bolt (9), then nut (8) and tighten.
(4)Install washers (5), bolts (4), and tighten.
(5)Install washer (13), bolt (12), then nut (11) and tighten.
(6)Connect electrical connectors :
- for connector (1) from Loop A, 23WD (22WD) on ENG1 (ENG2), connect plug 1911VC (1910VC).
- for connector (2) from Loop B, 27WD (26WD) on ENG1 (ENG2), connect plug 1909VC (1908VC).
(7)Remove safety clips and tags and close circuit breakers :
1WD, 2WD, 3WD, 4WD, 5WD and 6WD.




Fire Sensing Element
Figure 402

R

G. Test
Perform loop test (Ref. 26-12-00, P. Block 501).

H. Close-Up
(1)If removed, install fire shield (protecting hydraulic and fuel lines, right side of engine).
(2)Install drain line (right side of engine) (Ref. 71-70-51, P. Block 401).
(3)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(4)Remove access platforms.
R (5)Close engine cowl doors (Ref. 71-13-00, P. Block 301) and remove safety clips and tags and close circuit breakers.

I. Removal/Installation of Fire Sensing Element Assembly on left and Right Sides of Engine Core.
(1)Job set-up
R (a)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Open, safety and tag the following circuit breakers.

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | ENG FIRE DET/ENG 1/LOOP A | 1WD | 209/A19 |
| 22VU | ENG FIRE DET/ENG 2/LOOP A | 2WD | 209/A24 |
| 22VU | ENG FIRE DET/ENG 1/LOOP B | 3WD | 209/A20 |
| 22VU | ENG FIRE DET/ENG 2/LOOP B | 4WD | 209/A23 |
| 22VU | ENG FIRE DET/ENG 1/WARN | 5WD | 209/A21 |
| 22VU | ENG FIRE DET/ENG 2/WARN | 6WD | 209/A22 |

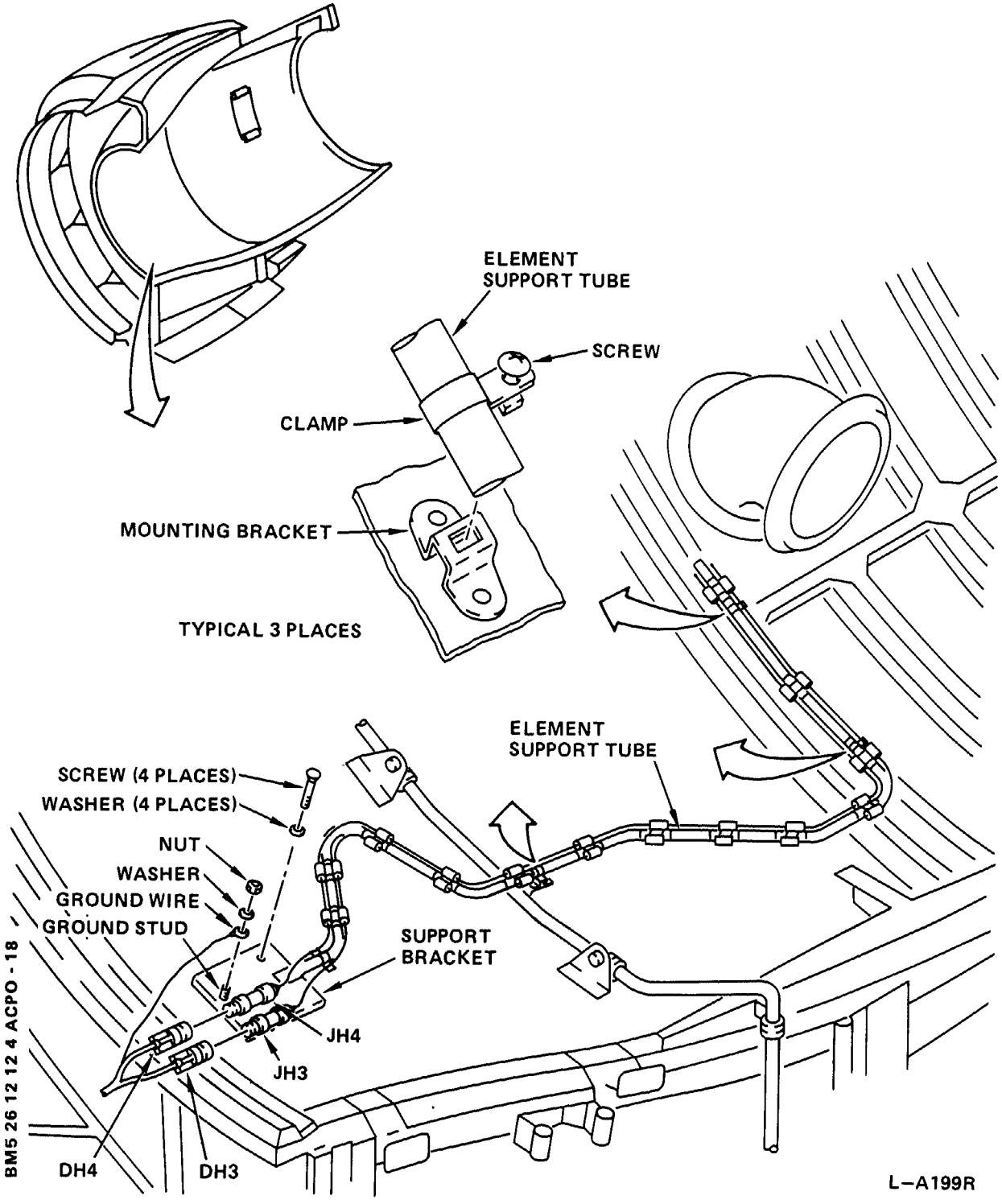
(c)Open safety and tag the circuit breaker for the appropriate engine and open thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
(d)Position access platforms.
(2)Removal of left and right fire sensing element assembly.
(Ref. Fig. 403, 404)
(a)Remove left fire sensing element assembly
1 Remove nut and washer attaching ground wire to support bracket ground stud.
2 Disconnect fire detector electrical connectors DH1 and DH2. Install protective covers on connectors and receptacles.
3 Turn three element support tube clamp screws one-quarter turn counter-clockwise to detach clamps from mounting brackets.
4 Remove four support bracket screws and washers attaching fire detector assembly to thrust reverser door.
(b)Remove right fire sensing element assembly
1 Remove nut and washer attaching ground wire to support bracket ground stud.
2 Disconnect fire detector electrical connectors DH3 and DH4. Install protective covers on connectors and receptacles.
3 Turn three element support tube clamp screws one-quarter turn counter-clockwise to detach clamps from mounting brackets.
4 Remove four support bracket screws and washers attaching fire detector assembly to thrust reverser door.

(3)Preparation of replacement component
(a)Visually inspect :
1 Sensing elements
2 Support tube and attachment clamps.
(4)Installation of fire sensing element assembly, left and right
(a)Install left fire sensing element assembly (Ref. Fig. 403).
1 Attach fire detector assembly to thrust reverser door with four washers and screws through support bracket. TORQUE screws to between 32 and 36 lbf.in. (0.56 to 0.79 m.daN).
2 Turn three element support tube clamp screws one-quarter turn clockwise to attach clamps to mounting brackets.
3 Remove protective covers and connect electrical connector DH1 to receptacle JH1 (Loop A) and DH2 to JH2 (Loop B). Tighten connectors fingertight plug one-eighth turn.
4 Attach ground wire to support bracket ground stud with washer and nut. TORQUE nut to between 32 and 36 lbf.in. (0.56 to 0.79 m.daN).
(b)Install right fire sensing element assembly (Ref. Fig. 404)
1 Attach fire detector assembly to thrust reverser door with four washers and screws through support bracket. TORQUE screws to between 32 to 36 lbf.in. (0.56 to 0.79 m.daN).
2 Turn three element support tube clamp screws one-quarter turn clockwise to attach clamps to mounting brackets.
3 Remove protective covers and connect electrical connector DH3 to receptacle JH3 (Loop A) and DH4 to JH4 (Loop B). Tighten connectors fingertight plug one-eighth turn.
4 Attach ground wire to support bracket ground stud with washer and nut. TORQUE nut to between 32 to 36 lbf.in. (0.56 to 0.79 m.daN).

(5)Test
(a)Initial conditions
R 1 Connect electrical ground power unit and energize the aircraft
R electrical network (Ref. 24-41-00, P. Block 301).
R 2 Make certain that :
- circuit breakers 1WD, 2WD, 3WD, 4WD, 5WD and 6WD are closed
R - OFF legend of LOOP A and LOOP B pushbutton switches (pressed in) are off.
(b)Procedure

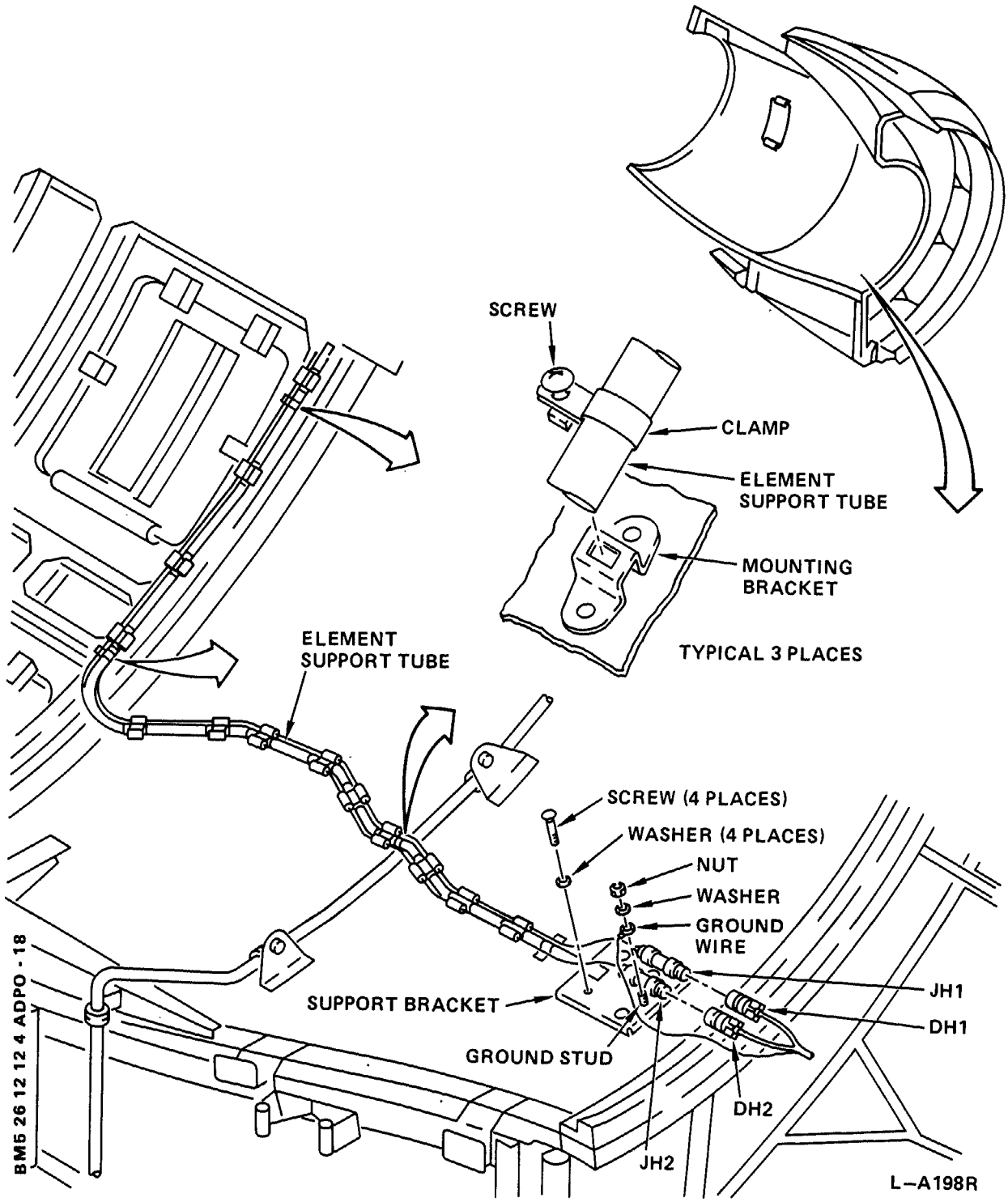
| ACTION | RESULT |
|---|---|
| On ENG FIRE control modules 39WD and 40WD : | |
| - press LOOP TEST pushbutton switch | - LOOP A and LOOP B legends come on. |
| - release LOOP TEST pushbutton switch | - LOOP A and LOOP B legends go off. |

(6)Close-Up
(a)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(b)Remove access platforms.
(c)De-energize the aircraft electrical network (Ref. 24-41-00,




Fire Sensing Element - Right Side
Figure 403

R




Fire Sensing Element - Left Side
Figure 404

R

P. Block 301).

(d)Close thrust reverser cowl doors (Ref. 71-13-00, P. Block 301). Remove safety clips and tags and close circuit breakers.

R FIRE SENSING ELEMENTS - REMOVAL/INSTALLATION

R 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Corrosion - Resistant Steel Lockwire Dia 0.5 mm (0.020 in.) |
| Referenced Procedures | |
| - 71-13-00, P. Block 301 | Cowl Doors |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 20-21-12, P. Block 1 | Tightening Torques |
| - 71-70-51, P. Block 401 | Engine Drain Line |
| - 26-12-00, P. Block 501 | Engine Fire and Overheat Detection |

2. Procedure

A. Job Set-Up
(1)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)Position access platforms.
(3)Open engine cowl doors (Ref. 71-13-00, P. Block 301).
(4)Open, safety and tag the following circuit breakers.

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | ENG FIRE DET/ENG 1/LOOP A | 1WD | 209/A19 |
| 22VU | ENG FIRE DET/ENG 2/LOOP A | 2WD | 209/A24 |
| 22VU | ENG FIRE DET/ENG 1/LOOP B | 3WD | 209/A20 |
| 22VU | ENG FIRE DET/ENG 2/LOOP B | 4WD | 209/A23 |
| 22VU | ENG FIRE DET/ENG 1/WARN | 5WD | 209/A21 |
| 22VU | ENG FIRE DET/ENG 2/WARN | 6WD | 209/A22 |

(5)Remove harness support so that harness can be stowed on one side.
NOTE : All attachment hardware is re-used.
(6)Remove drain line (right side of engine) (Ref. 71-70-51, P. Block 401).
(7)If necessary, remove fire shield (protecting hydraulic and fuel lines, right side of engine).

B. Removal of Support Tube and Sensing Element Assembly from Pylon
NOTE : Removal procedure is identical for each engine.
(Ref. Fig. 401)
(1)Disconnect electrical connectors :
(a)For connector (8) from loop A, 23WD (22WD) on ENG1 (ENG2), disconnect plug 2083VC (2076VC).
(b)For connector (5) from loop B, 27WD (26WD) on ENG1 (ENG2), disconnect plug 2075VC (2084VC).
(2)Remove bolts (1) and washers (2).
(3)Remove bolts (3) and washers (2).
(4)Remove nuts (4) while holding support bracket (9).
(5)Remove bolt (6) and washer (7).

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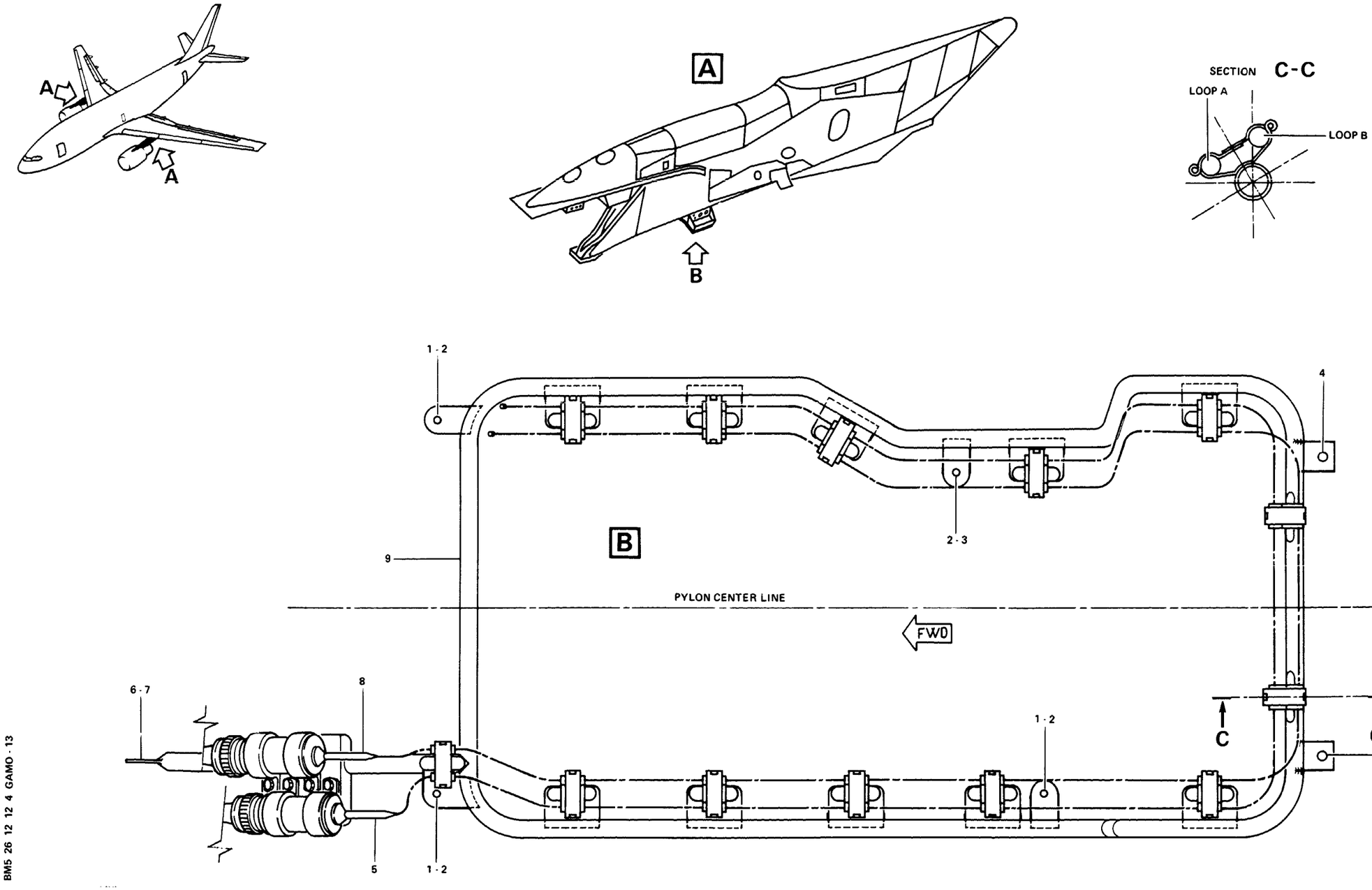


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Pylon Sensing Element Assembly
Figure 401

(6)Remove support bracket (9).

C. Removal of Sensing Element from Support Tube
R (Ref. Fig. 402)
(1)Untighten camlocs (1) and open dual clamps to free grommets supporting the sensing element to be removed.
(2)Remove bolts (4) from the two clamps securing responder housing (3) to the plate.
(3)Remove fire sensing element and retain grommets (2) and hardware.

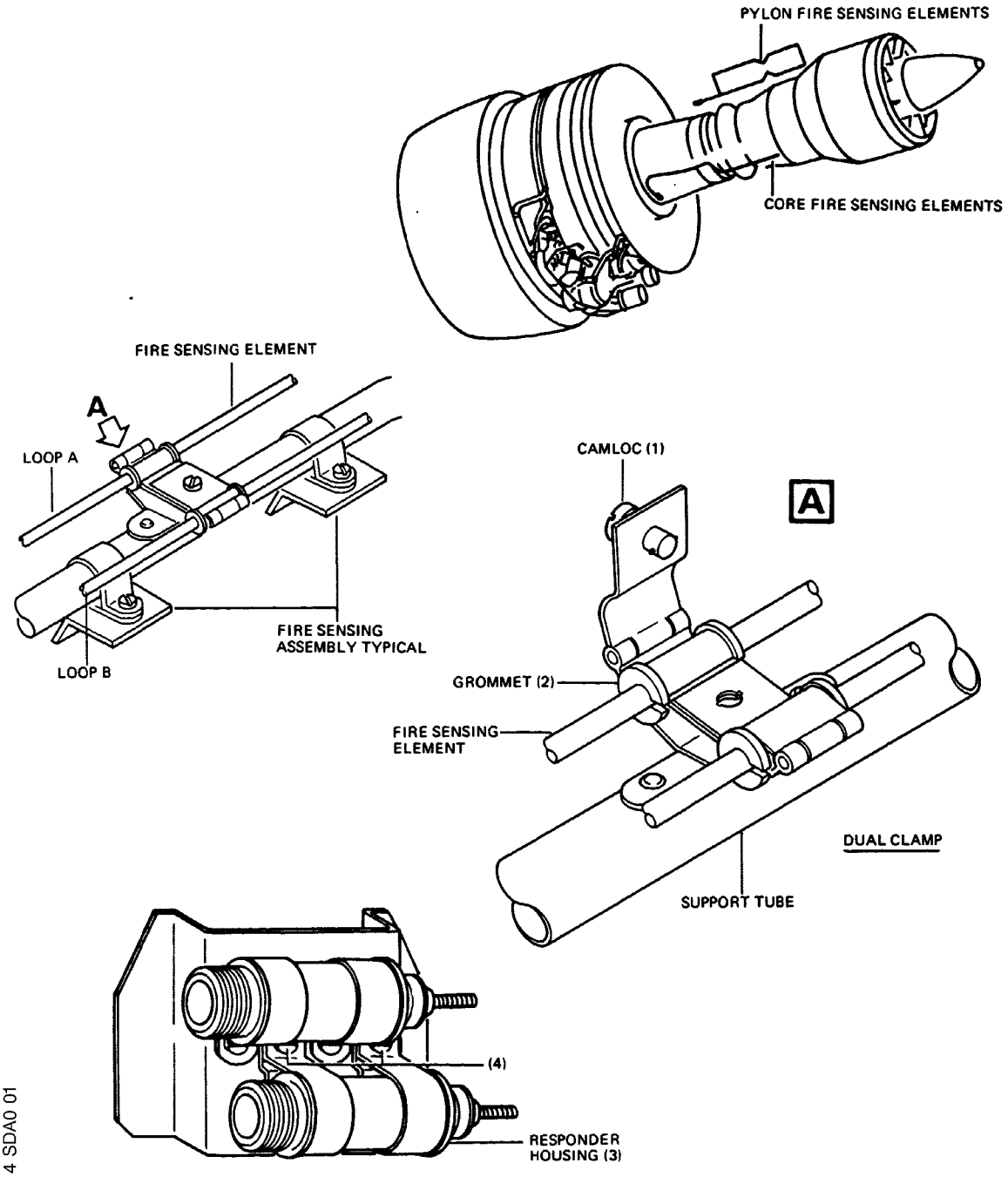
D. Preparation of Replacement Component
(1)Visually inspect :
(a)Sensing element
(b)Support tube and attachment clamps.
(2)Install grommets (2) on replacement component.

E. Installation of Sensing Element on Support Tube (Ref. Fig. 402)
WARNING : MAKE CERTAIN THAT THE CIRCUIT BREAKERS CONCERNED ARE OPEN BEFORE ATTEMPTING THE INSTALLATION PROCEDURE.
(1)Position sensing element.
(2)Attach responder (3) on support plate by means of two clamps.
(3)Install each grommet on its dual clamp, close clamps and tighten camlocs (1).
(4)Adjust responder housing positioning on the plate, if necessary.
(5)On the full length of the sensing elements make certain that :
(a)Distance between the two sensing elements installed on same support is not less than 15 mm.
(b)Distance between sensing elements and support is more than 6 mm.

F. Installation of Support Tube and Sensing Element Assembly on Pylon
(Ref. Fig. 401)
NOTE : Installation procedure is identical for each engine.
(1)Position support bracket (9).
(2)Install washer (7) then install and tighten bolt (6).
(3)Install and tighten nuts (4).
(4)Install washers (2) then install and tighten bolts (3).
(5)Install washers (2) then install and tighten bolts (1).
(6)Connect electrical connectors :
(a)For connector (8) from loop A, 23WD (22WD) on ENG1 (ENG2), connect plug 2083VC (2076VC).
(b)For connector (5) from loop B, 27WD (26WD) on ENG1 (ENG2), connect plug 2075VC (2084VC).
(7)Remove safety clips and tags and close circuit breakers 1WD, 2WD, 3WD, 4WD, 5WD and 6WD.

G. Test
Perform loop test (Ref. 26-12-00, P. Block 501).

H. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

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R Fire Sensing Element
Figure 402

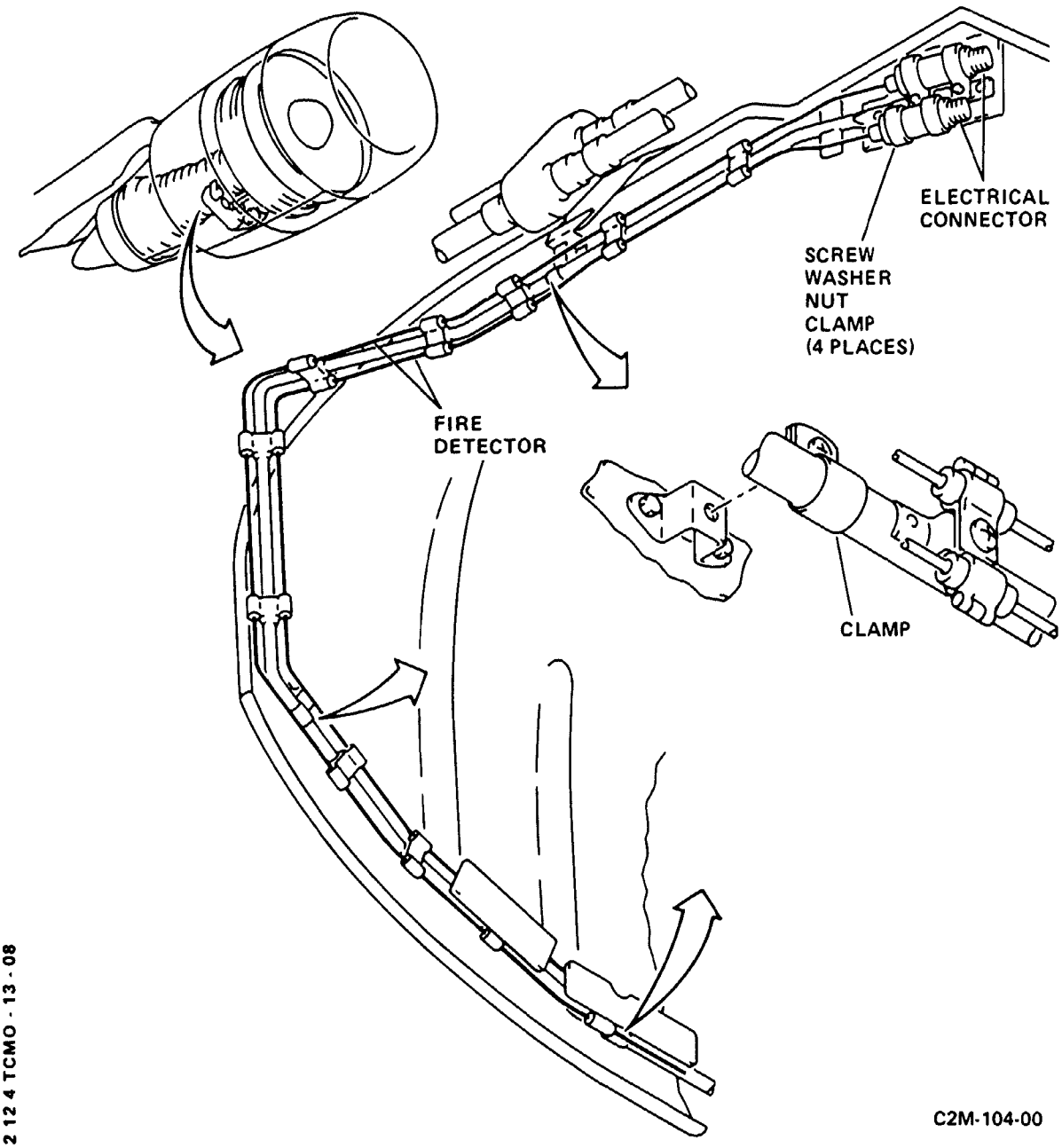
(2)Remove access platforms.
(3)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(4)Close engine cowl doors (Ref. 71-13-00, P. Block 301).

I. Removal/Installation of Loop Assembly on Left and Right Sides of Engine Core

(1)Job Set-Up
(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Open, safety and tag the following circuit breakers.

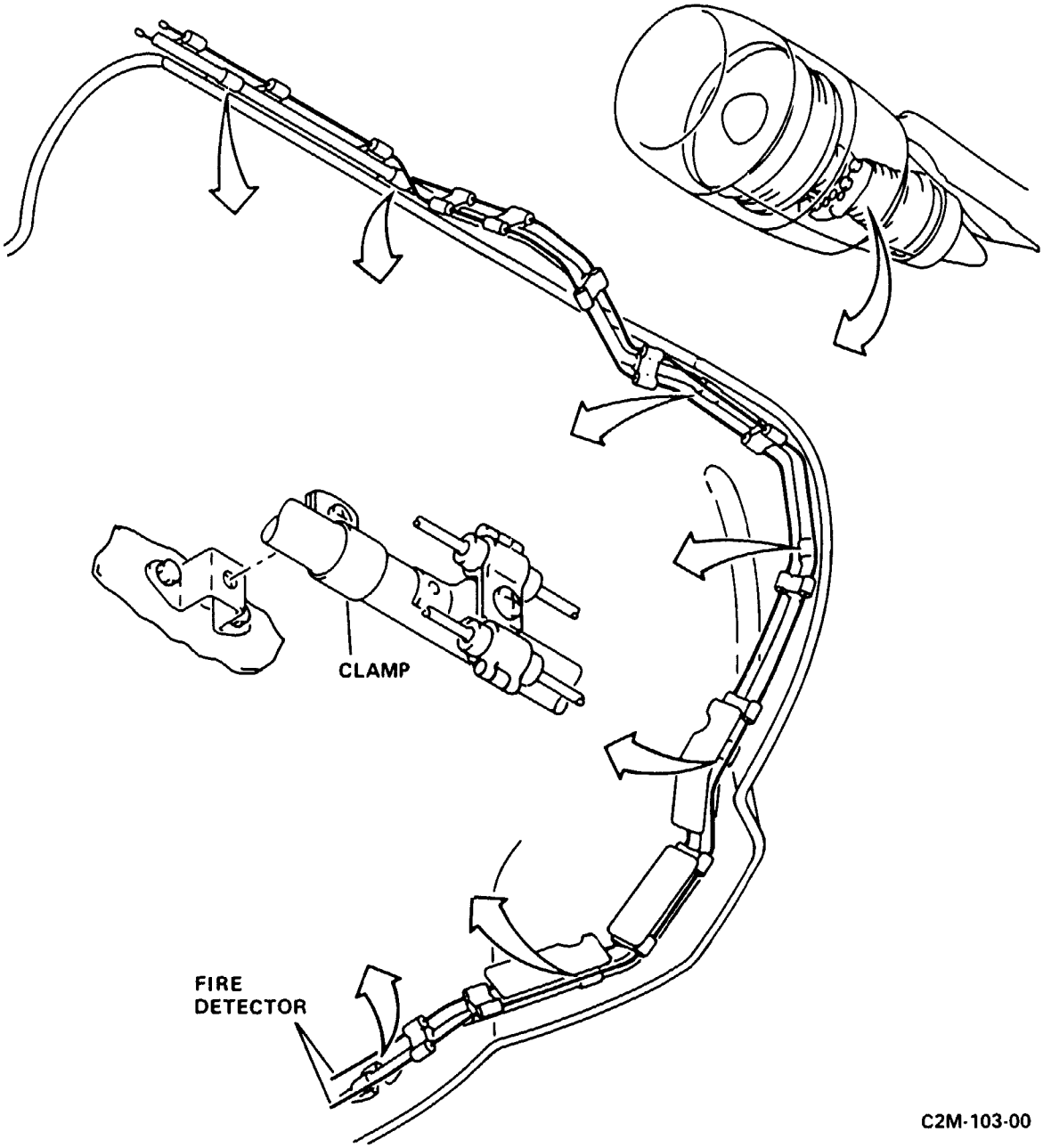
| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | ENG FIRE DET/ENG 1/LOOP A | 1WD | 209/A19 |
| 22VU | ENG FIRE DET/ENG 2/LOOP A | 2WD | 209/A24 |
| 22VU | ENG FIRE DET/ENG 1/LOOP B | 3WD | 209/A20 |
| 22VU | ENG FIRE DET/ENG 2/LOOP B | 4WD | 209/A23 |
| 22VU | ENG FIRE DET/ENG 1/WARN | 5WD | 209/A21 |
| 22VU | ENG FIRE DET/ENG 2/WARN | 6WD | 209/A22 |

(c)Open, safety and tag circuit breakers for the appropriate engine and open thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
(d)Position access platforms.
(2)Removal of left and right fire sensing element assembly.
(Ref. Fig. 403)
(Ref. Fig. 404)
NOTE : Removal procedure is identical for left and right sides of engine core.
(a)Remove screws, washers, nuts and clamps attaching fire sensing element electrical connectors to heat shield bracket.
(b)Disconnect clamps (10 places) and remove fire sensing element from heat shield brackets.
(3)Removal of sensing element (Ref. Fig. 402)
Refer to Para. 2.C.
(4)Preparation of replacement component
(a)Visually inspect :
1 Sensing elements
2 Support tube and attachment clamps.
(5)Installation of sensing element (Ref. Fig. 402)
Refer to Para. 2.E.
(6)Installation of left and right fire sensing element assembly
(Ref. Fig. 403, 404)
(a)Install fire sensing element on heat shield brackets with clamps (10 places).
(b)Attach fire sensing element electrical connectors to heat shield bracket with clamps, screws, washers and nuts. Tighten nuts to between 20 and 25 lbf. in. (0.23 and 0.28 m.daN).
(7)Test
Perform loop test (Ref. 26-12-00, P. Block 501).
(8)Close-up
(a)If removed, install fire shield (protecting hydraulic and fuel lines,




BM5 26 12 12 4 TCMO - 13 - 08
DM5

Fire Sensing Element - Right Side
Figure 403




BM5 26 12 12 4 TEMO - 13 - 08
DM5

Fire Sensing Element - Left Side
Figure 404

right side of engine).
(b)Install drain line (right side of engine) (Ref. 71-70-51, P. Block 401.)
(c)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(d)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(e)Remove safety clips and tags and close circuit breakers.
(f)Close thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).

FIRE EXTINGUISHER TUBES - REMOVAL/INSTALLATION

PRE SB GE 26-001
Not applicable.
END PRE SB GE 26-001
POST SB GE 26-001

1. Equipment and Materials

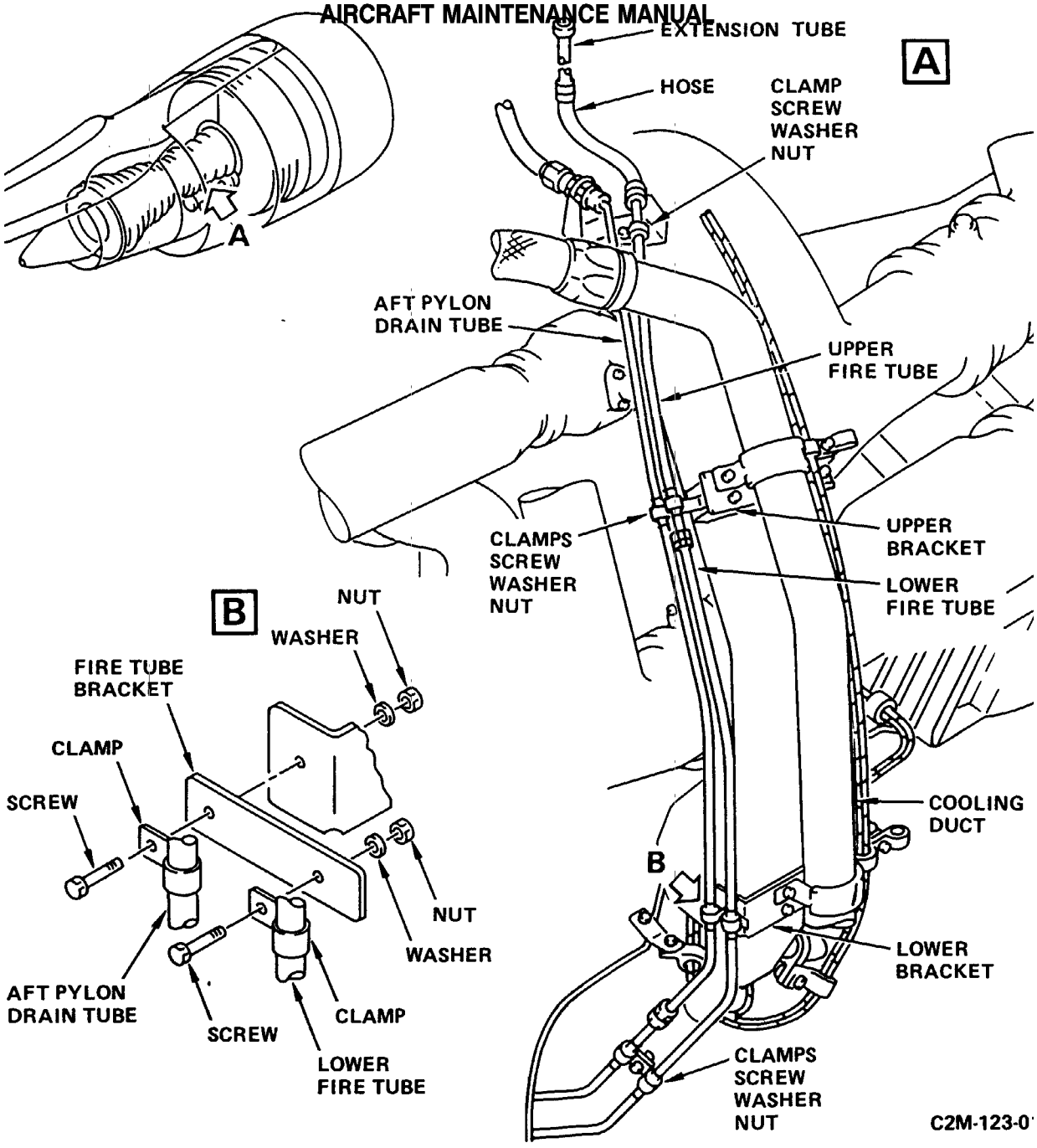
| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Access Platform |
| C. | Protective Covers |
| D. | Torque Wrench |
| Referenced Procedures | |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 71-13-00, P. Block 301 | Cowl Doors |

2. Procedure

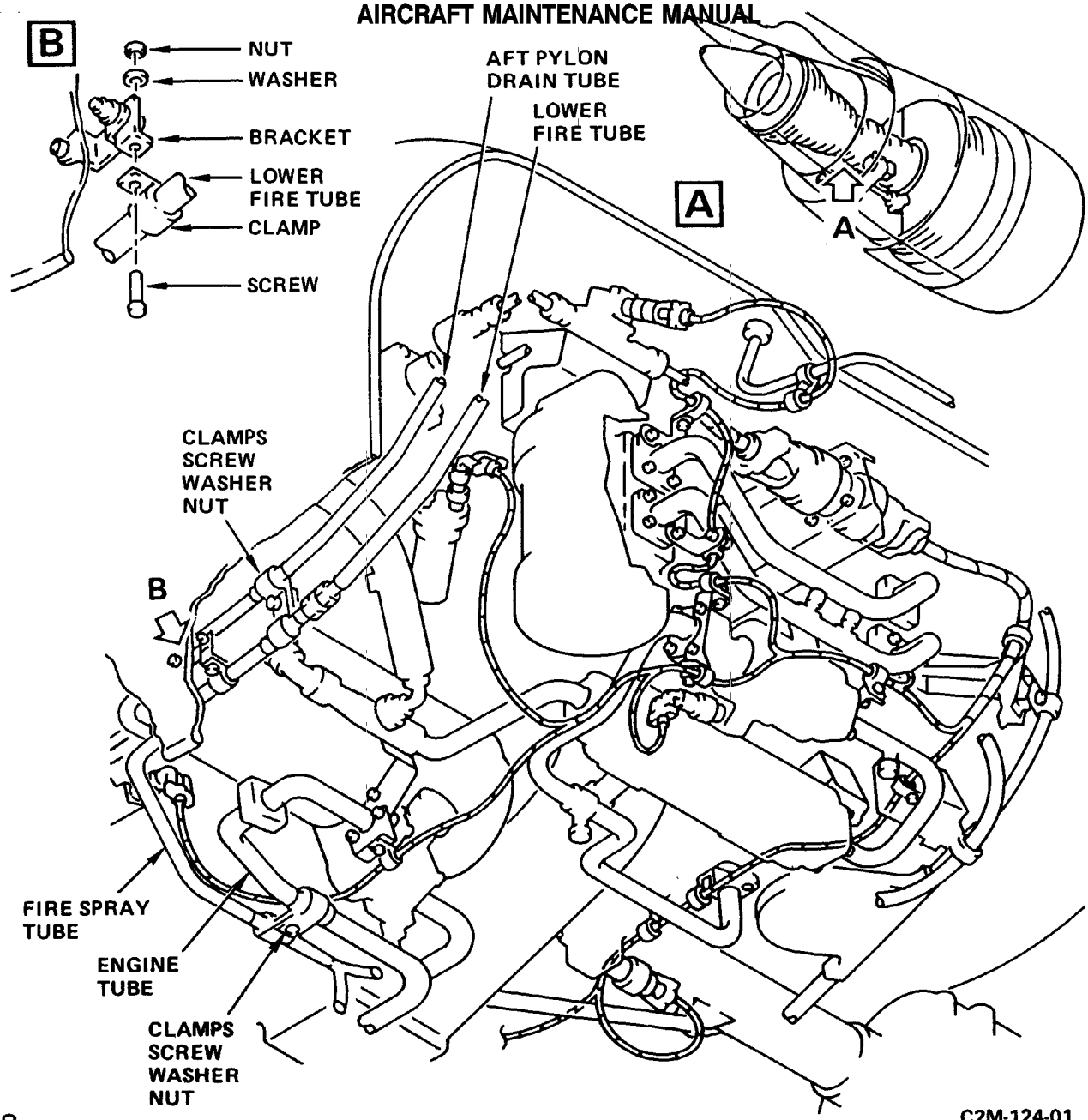
A. Job Set-Up
(1)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)Put the access platforms into position.
(3)Open the thrust reverser and fan cowl doors (Ref. 71-13-00, P. Block 301).
(4)Open, safety, and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | ENG FIRE DET/ENG 1/LOOP A | 1WD | 209/A19 |
| 22VU | ENG FIRE DET/ENG 2/LOOP A | 2WD | 209/A24 |
| 22VU | ENG FIRE DET/ENG 1/LOOP B | 3WD | 209/A20 |
| 22VU | ENG FIRE DET/ENG 2/LOOP B | 4WD | 209/A23 |
| 22VU | ENG FIRE DET/ENG 1/WARN | 5WD | 209/A21 |
| 22VU | ENG FIRE DET/ENG 2/WARN | 6WD | 209/A22 |

B. Removal
(Ref. Fig. 401)
(Ref. Fig. 402)
(1)Remove the screws, washers, nuts, and clamps that attach the fire spray tube to the aft pylon drain tube and the engine tube.
(2)Remove the screw, washer, nut, and clamp that attach the fire spray tube to the clip on the heat shield.
(3)Remove the fire spray tube from the lower fire tube.
(4)Remove the screw, washer, nut, and clamp that attach the lower fire tube to the fire tube bracket.
(5)Remove the screw, washer, nut, and clamps that attach the lower fire tube to the aft pylon drain tube.
(6)Remove the lower fire tube from the upper fire tube.
(7)Remove the hose from the upper fire tube and the extension tube.
(8)Remove the screw, washer, nut, and clamps that attach the upper fire tube




Fire Extinguisher Tubes - Upper
Figure 401




BM5 26 12 13 4 GCMO - 00

Fire Extinguisher Tubes - Lower
Figure 402

and the aft pylon drain tube to the upper bracket.
(9)Remove the screw, washer, nut, and clamps that attach the upper fire tube and the aft pylon drain tube to the welded bracket.
(10)Remove the upper fire tube.
(11)Install covers on open tubes.

C. Installation (Ref. Fig. 401, 402)
(1)Remove the covers from open tubes.
(2)Connect the hose to the extension tube and the upper fire tube. Tighten the tube nuts by hand.
(3)Attach the upper fire tube and the aft pylon drain tube to the upper bracket with clamps, screw, washer, and nut. Do not torque the nut at this time.
(4)Attach the upper fire tube and the aft pylon drain tube to the welded bracket with clamps, screw, washer, and nut. Do not torque the nut at this time.
(5)Connect the lower fire tube to the upper fire tube. Tighten the tube nut by hand.
(6)Attach the lower fire tube to the fire tube bracket with clamp, screw, washer, and nut. Do not torque the nut at this time.
(7)Attach the lower fire tube to the aft pylon drain tube with clamps, screw, washer, and nut. Do not torque the nut at this time.
(8)Connect the fire spray tube to the lower fire tube. Tighten the tube nut by hand.
(9)Attach the fire spray tube to the engine tube with clamps, screw, washer, and nut. Do not torque the nut at this time.
(10)Attach the fire spray tube to the aft pylon drain tube with clamps, screw, washer, and nut. Do not torque the nut at this time.
(11)Attach the fire spray tube to the clip on the heat shield with a clamp, screw, washer, and nut. Do not torque the nut at this time.
NOTE : Make sure all of the parts are aligned and in their correct position before you torque them.
(12)TORQUE all of the nuts to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).
(13)TORQUE all of the tube nuts to between 410 and 450 lbf.in. (4.63 and 5.09 m.daN).

D. Close-Up
(1)Make sure that the working area is clean and clear of tools and any miscellaneous items of equipment.
(2)Remove access platform.
(3)Close thrust reverser and fan cowl doors (Ref. 71-13-00, P. Block 301).
END POST SB GE 26-001

# FIRE DETECTOR WIRE HARNESS - REMOVAL/INSTALLATION

## 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| B. | Access Platform |
| C. | Protective Covers |
| D. | Torque Wrench |
| R E. Material No.P05-052 | Special Materials (Ref. 70-00-00) |
| R F. Material No.P09-037 | Sealants (Ref. 70-00-00) |
| Referenced Procedures | |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 71-13-00, P. Block 301 | Cowl Doors |

## 2. Procedure

A. Job Set-Up

(1)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(2)Open, safety and tag the following circuit breakers.

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | ENG FIRE DET/ENG 1/LOOP A | 1WD | 209/A19 |
| 22VU | ENG FIRE DET/ENG 2/LOOP A | 2WD | 209/A24 |
| 22VU | ENG FIRE DET/ENG 1/LOOP B | 3WD | 209/A20 |
| 22VU | ENG FIRE DET/ENG 2/LOOP B | 4WD | 209/A23 |
| 22VU | ENG FIRE DET/ENG 1/WARN | 5WD | 209/A21 |
| 22VU | ENG FIRE DET/ENG 2/WARN | 6WD | 209/A22 |

(3)Open, safety and tag circuit breakers for the appropriate engine and open thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).

(4)Position access platforms.

R PRE SB PW4NAC 78-55

B. Removal

(Ref. Fig. 401)
(Ref. Fig. 402)
(Ref. Fig. 403)
(Ref. Fig. 404)
(Ref. Fig. 405)
(Ref. Fig. 406)

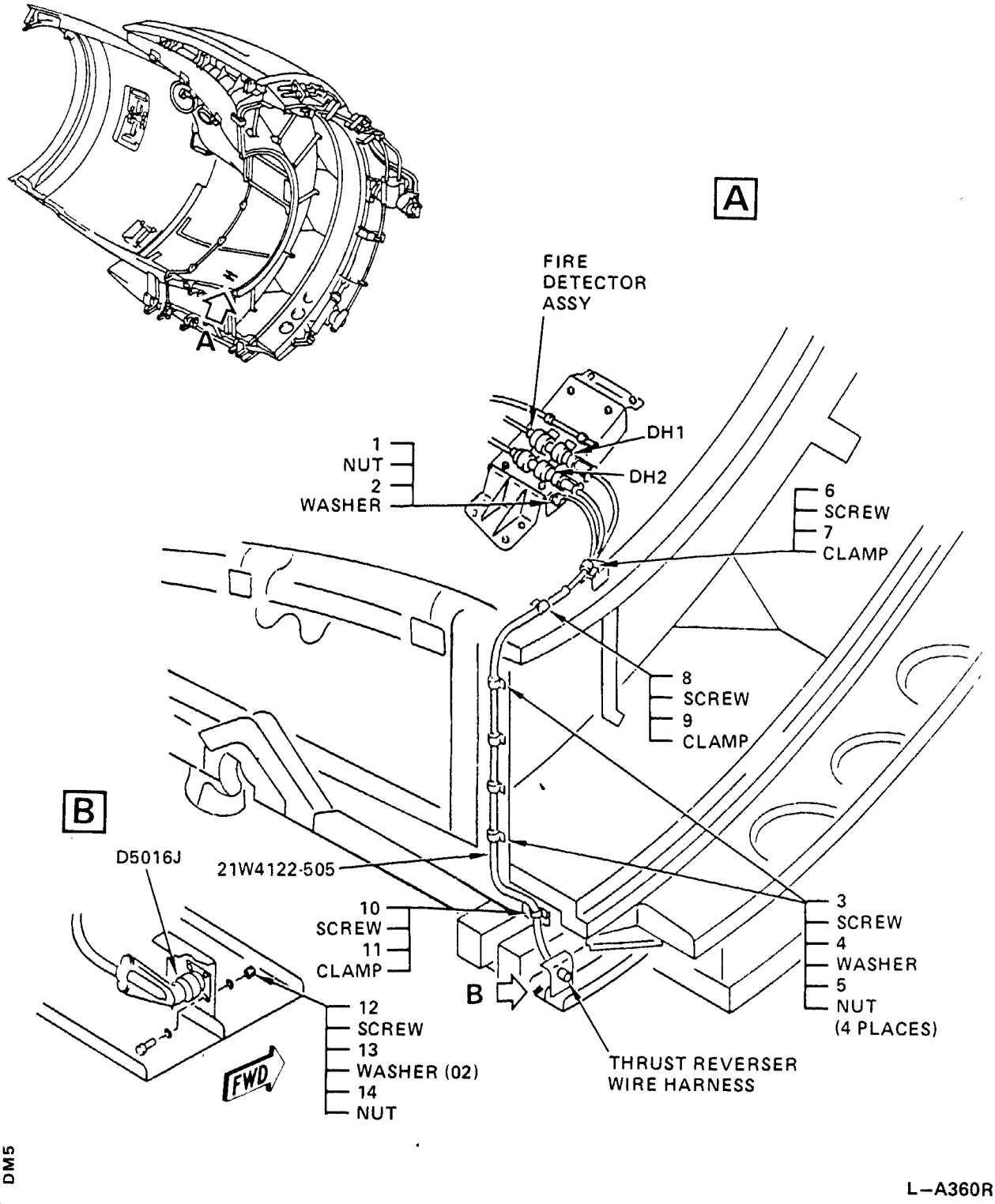
(1)Remove left fire detector wire harness (21W4122) (Ref. Fig. 401).

(a)Disconnect electrical connector D5016P from D5016J.
Install protective covers on connector and receptacle.

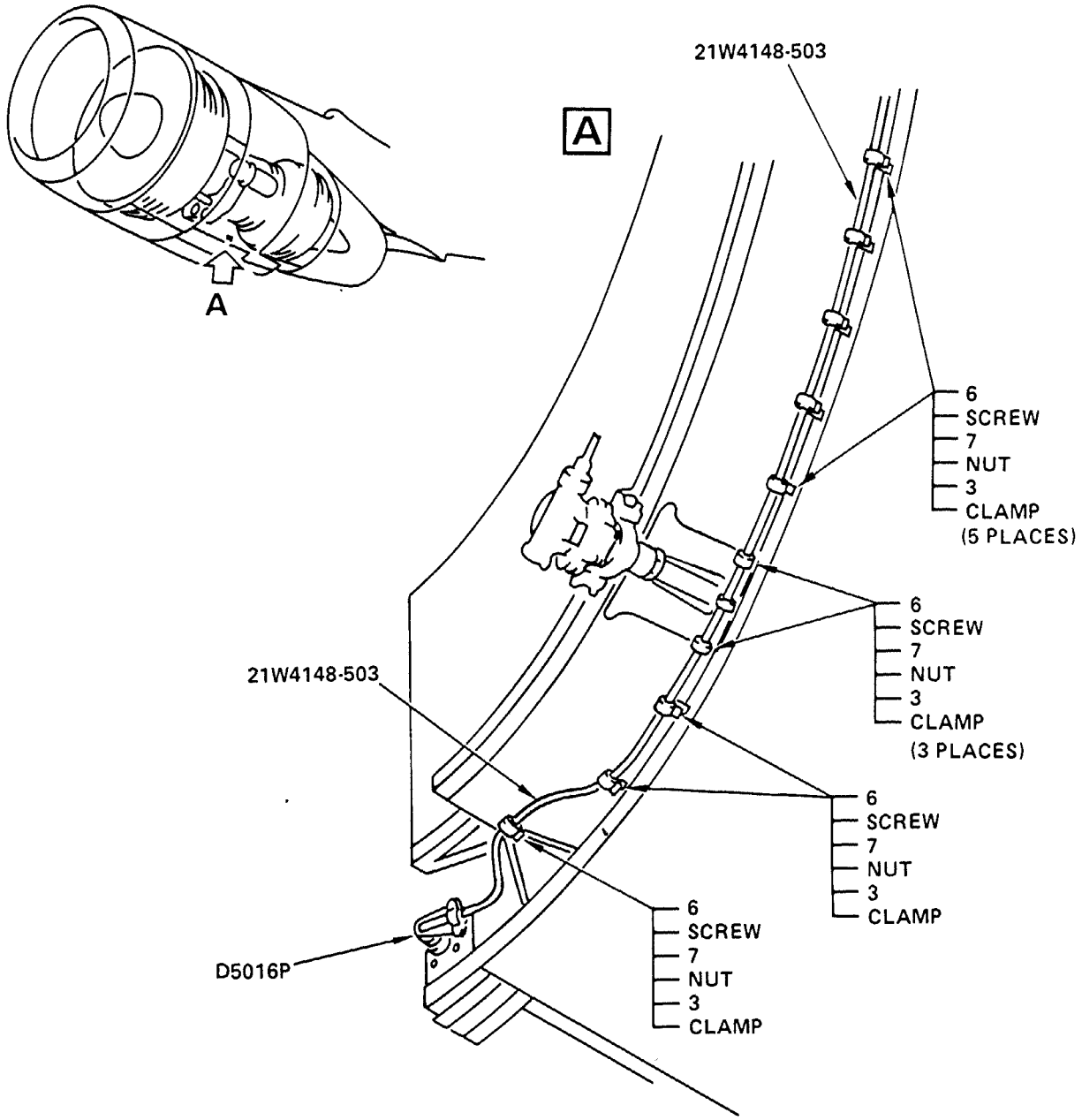
(b)Remove four screws (12), eight washers (13) and four nuts (14) attaching electrical receptacle D5016J to mounting bracket.

(c)Remove screw (10) attaching clamp (11) to thrust reverser door.

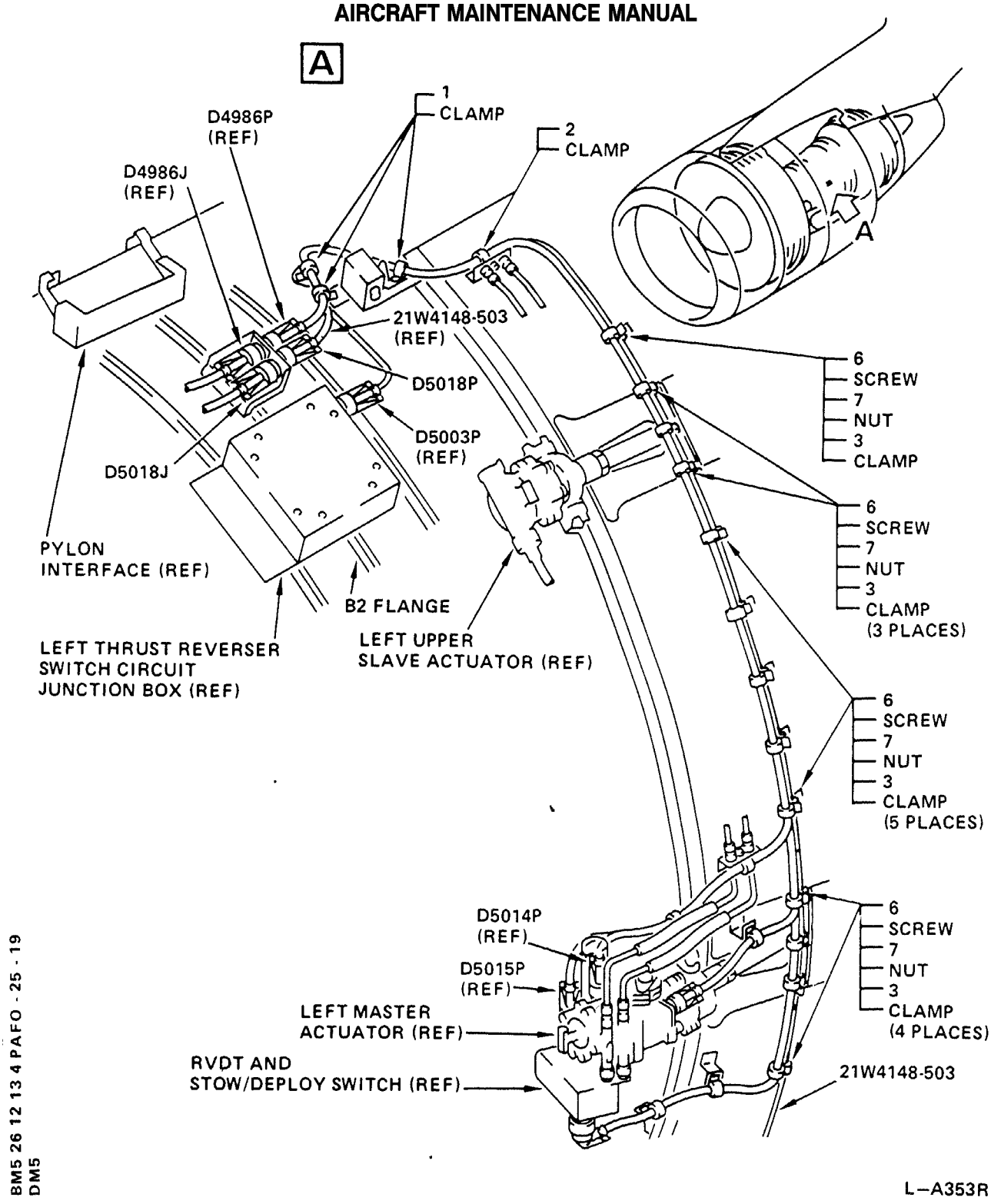
(d)Remove four screws (3), washers (4) and nuts (5) attaching four wire




Fire Detector Wire Harness - Left Side
Figure 401




T/R Fire Detector Wire Harness - Lower Left Side
Figure 402

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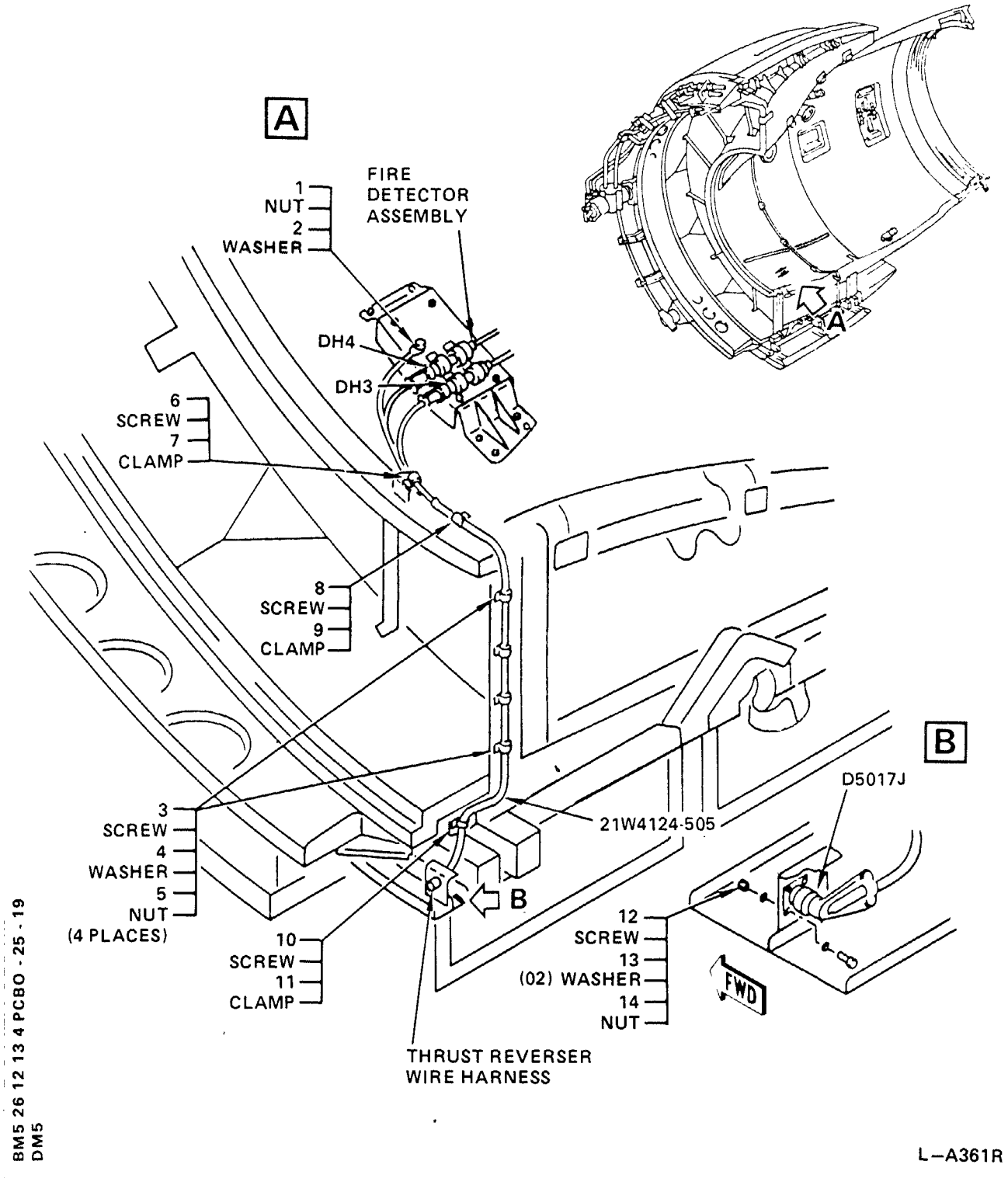
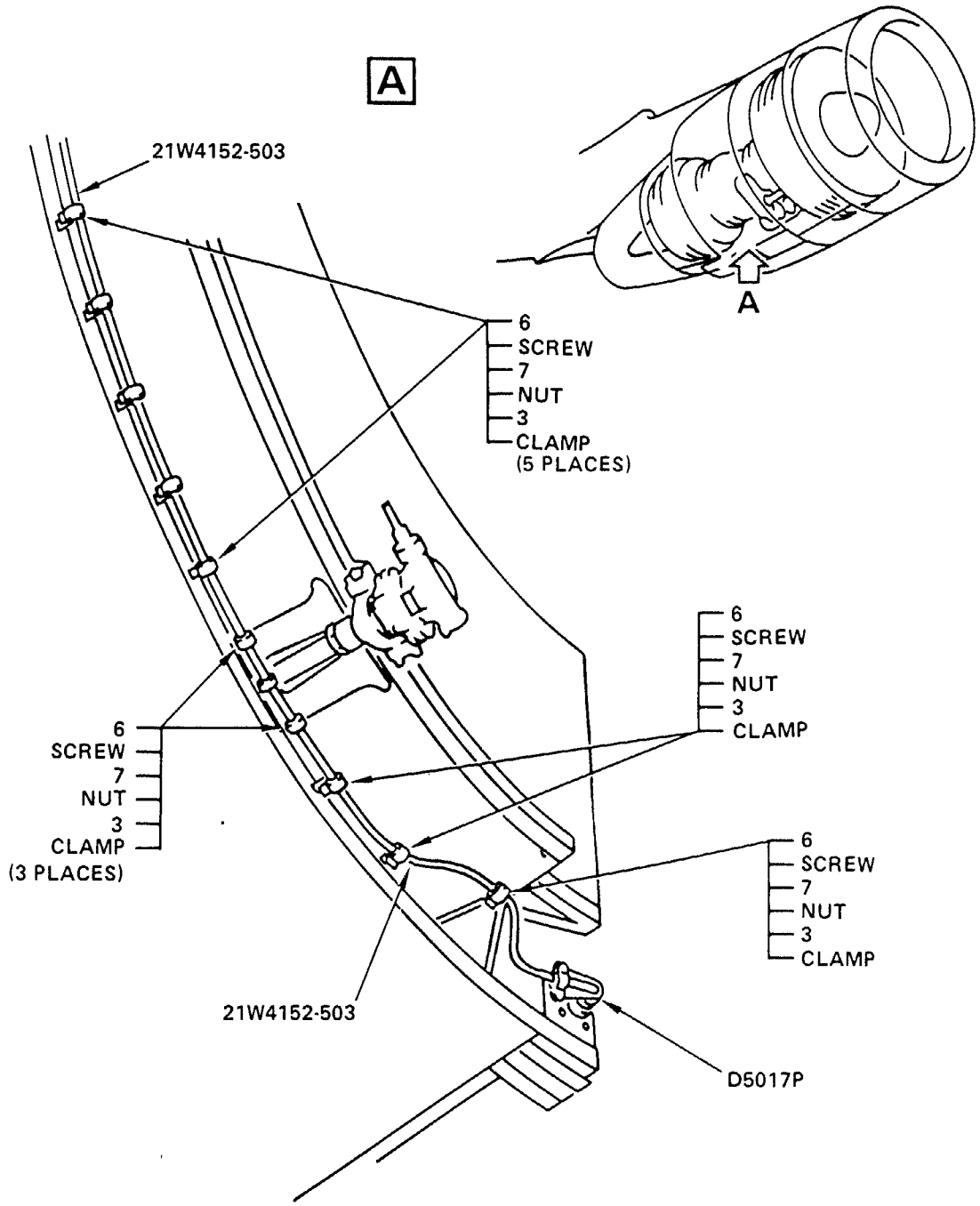
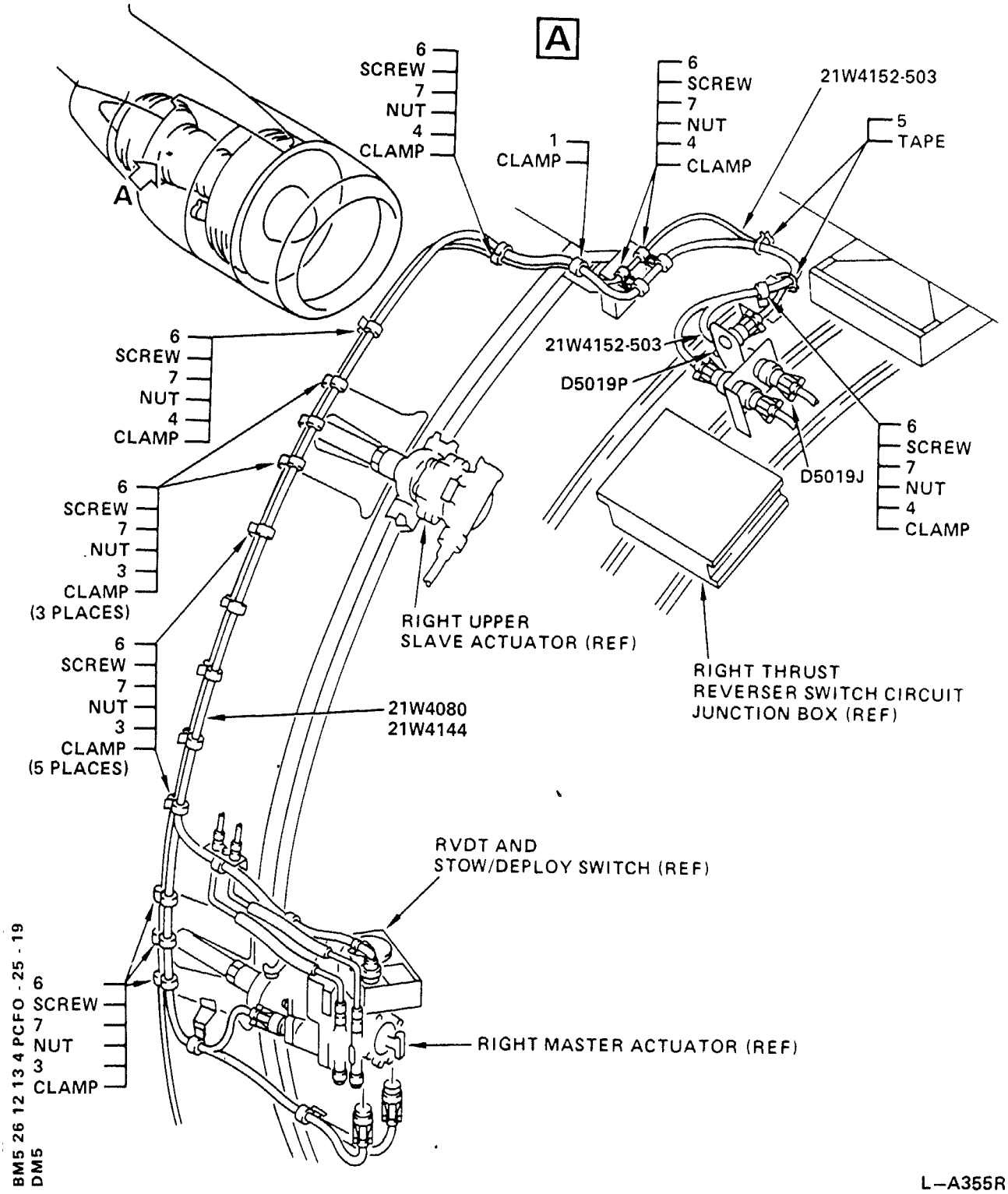
T/R Fire Detector Wire Harness - Upper Left Side
Figure 403




Fire Detector Wire Harness - Right Side
Figure 404



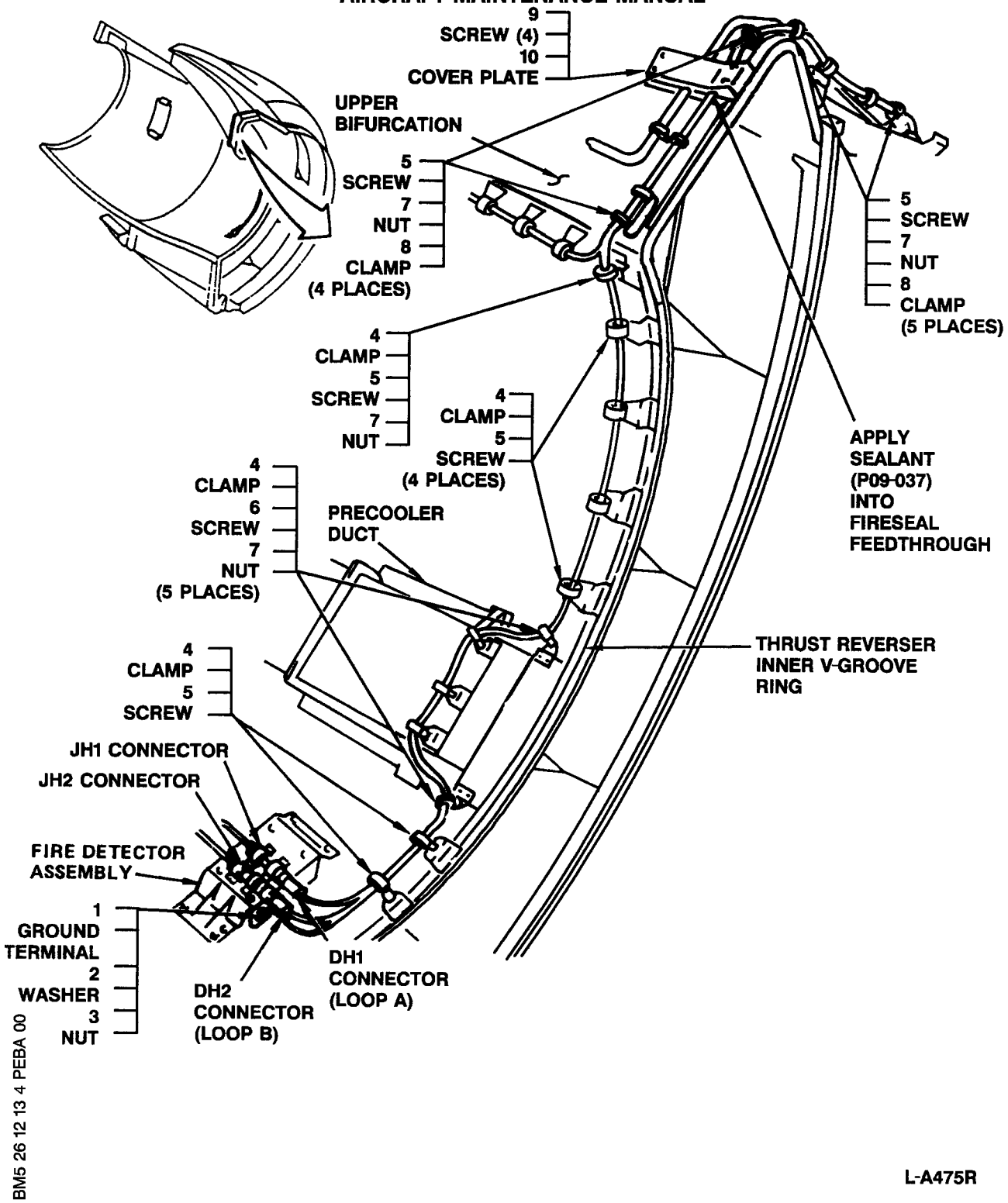

T/R Fire Detector Wire Harness - Lower Right Side
Figure 405




T/R Fire Detector Wire Harness - Upper Right Side
Figure 406

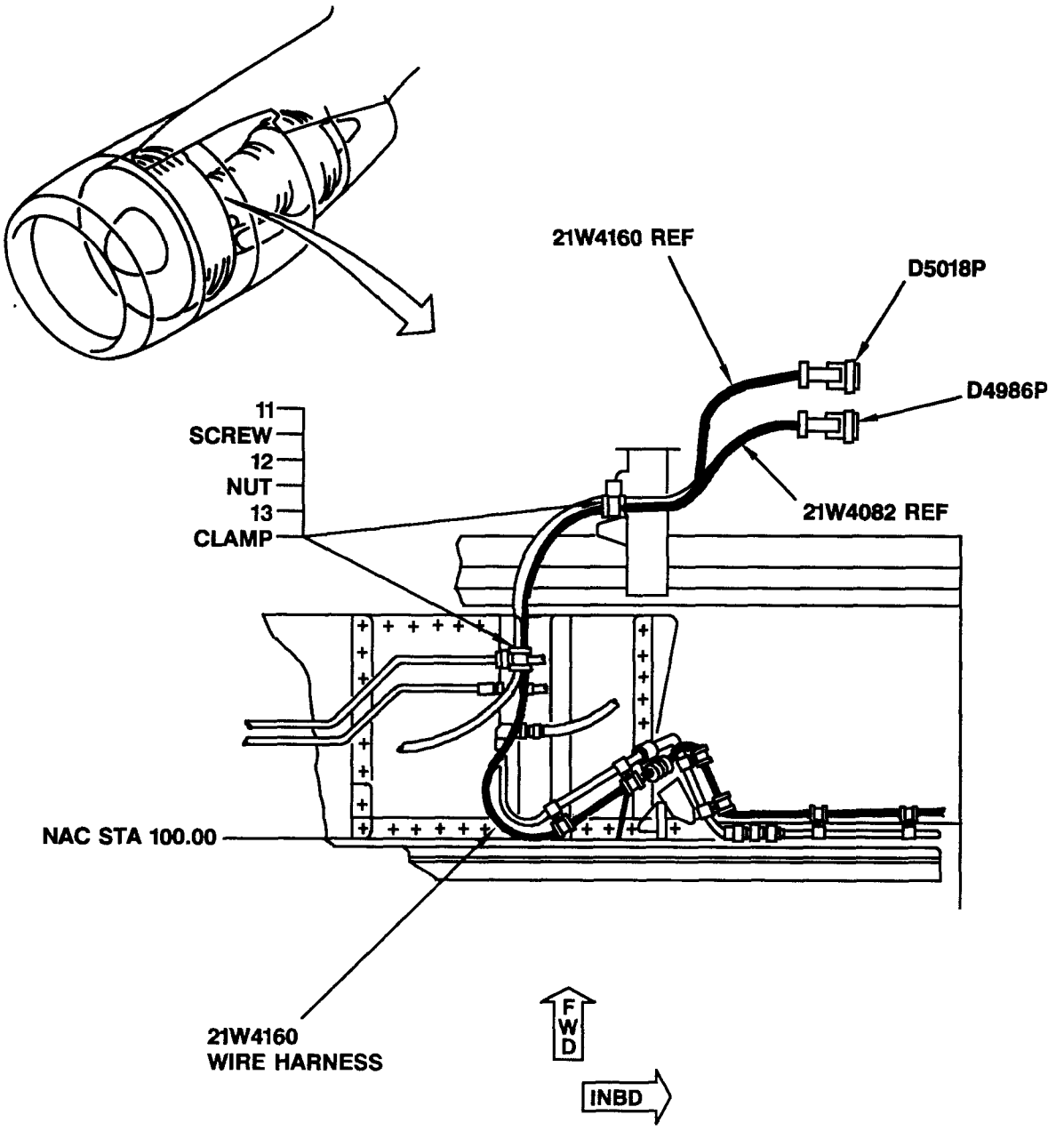
harness lugs to thrust reverser door.
(e)Remove screw (8) attaching clamp (9) to thrust reverser door.
(f)Remove screw (6) attaching clamp (7) to thrust reverser door.
(g)Remove nut (1) and washer (2) attaching ground wire 9971 to support bracket ground stud.
(h)Disconnect electrical connectors DH1 and DH2. Install protective covers on connectors and receptacles.
(2)Remove left T/R fire detector wire harness (21W4148). (Ref. Fig. 402, 403)
(a)If still attached, remove D5016P from receptacle D5016J. Install protective covers on connector and receptacle.
(b)Remove screw (6) and nut (7) attaching 23 clamps (3) to mounting brackets.
(c)Remove screw (6) and nut (7) attaching clamp (2) to bracket and remove harness 21W4148 from clamp.
(d)Remove screw (6) and nut (7) attaching three clamps (1) to brackets and remove harness 21W4148 from clamps.
(e)Disconnect electrical connector D5018P. Install protective covers on connector and receptacle.
(3)Remove right fire detector wire harness (21W4124) (Ref. Fig. 404).
(a)Disconnect electrical connector D5017P from D5017J. Install protective covers on connectors and receptacles.
(b)Remove four screws (12), eight washers (13) and four nuts (14) attaching electrical receptacle D5017J to mounting bracket.
(c)Remove screw (10) attaching clamp (11) to thrust reverser door.
(d)Remove four screws (3), washers (4) and nuts (5) attaching four wire harness lugs to thrust reverser door.
(e)Remove screw (8) attaching clamp (9) to thrust reverser door.
(f)Remove screw (6) attaching clamp (7) to thrust reverser door.
(g)Remove nut (1) and washer (2) attaching ground wire 9972 to support bracket ground stud.
(h)Disconnect electrical connectors DH3 and DH4. Install protective covers on connectors and receptacles.
(4)Remove right T/R fire detector wire harness (21W4152). (Ref. Fig. 405, 406)
(a)If still attached, remove D5017P from receptacle D5017J. Install protective covers on connector and receptacle.
(b)Remove screw (6) and nut (7) attaching 22 clamps (3) to mounting brackets.
(c)Remove screw (6) and nut (7) attaching two clamps (4) to brackets.
(d)Remove screw (6) and nut (7) attaching clamp (1) to brackets and remove harness 21W4152 from clamp.
(e)Remove screw (6) and nut (7) attaching two clamps (4) to brackets.
(f)Remove and discard tying tape (5) attaching harness 21W4152 to harnesses 21W4080 and 21W4144.
(g)Disconnect electrical connector D5019P. Install protective covers on connector and receptacle.

R POST SB PW4NAC 78-55
R B. Removal (Ref. Fig. 407, 408)
R (1)Remove left side fire detector wire harness (21W4160) (Ref. Fig. 407)




Thrust Reverser Fire Detector Wire Harness - Left Side
(Sheet 1/2)
Figure 407

R

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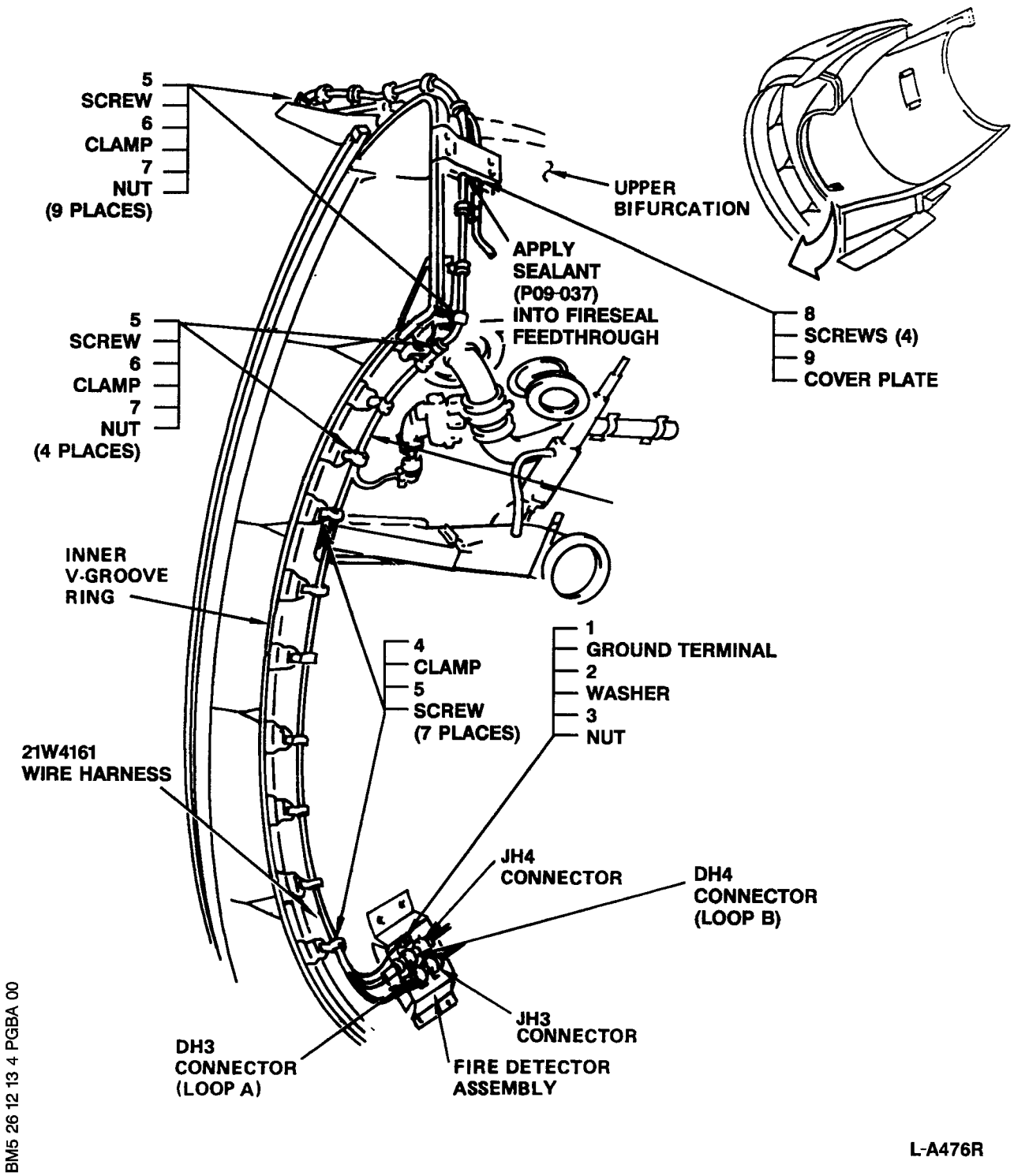
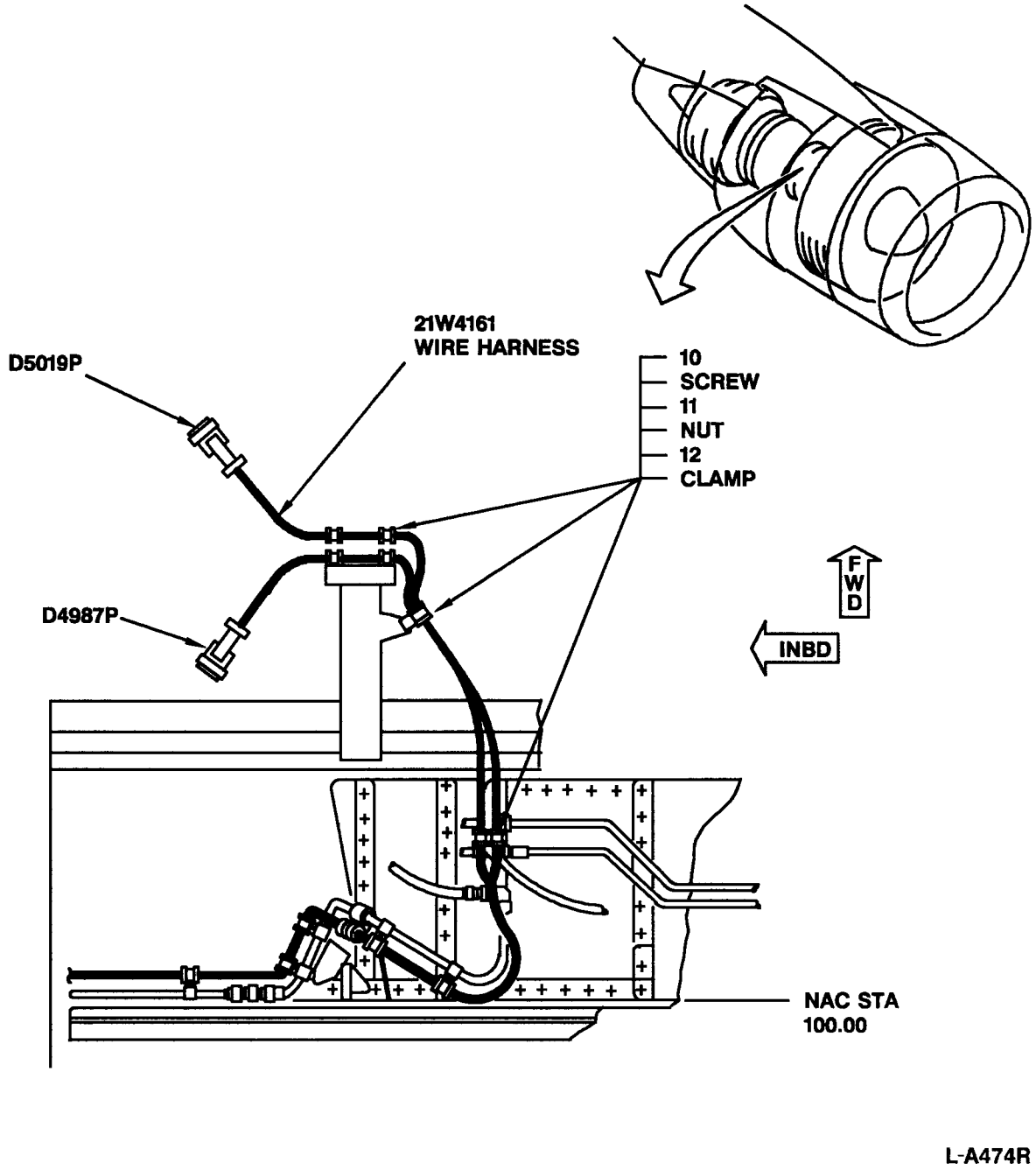
Thrust Reverser Fire Detector Wire Harness - Left Side
(Sheet 2/2)
Figure 407

R




Thrust Reverser Fire Detector Wire Harness - Right Side
(Sheet 1/2)
Figure 408

R




Thrust Reverser Fire Detector Wire Harness - Right Side
(Sheet 2/2)
Figure 408

R

R (a)Disconnect electrical connectors DH1 and DH2 from electrical connectors
R JH1 and JH2 at fire detector assembly. Install protective covers on
R connector and receptacle.
R (b)Disconnect GD9971DC ground wire (1) from grounding stud at fire
R detector assembly. Retain washer (2) and nut (3) for re-installation.
R (c)Remove two screws (5) securing two clamps (4) and 21W4160 wire harness
R to brackets on forward edge of lower inner thrust reverser wall.
R (d)Remove five nuts (7) and five screws (6) securing clamps (4) and wire
R harness to brackets around the precooler duct.
R (e)Remove four screws (5) securing four clamps (4) and wire harness to
R brackets along forward upper thrust reverser wall.
R (f)Remove nut (7), screw (5), and clamp (4) securing wire harness to
R top forward inner wall prior to intersection of nacelle cooling wire
R harness.
R (g)Remove four screws (9) securing cover plate (10) to thrust reverser
R upper bifurcation wall.
R (h)Remove four screws (5), four nuts (7), and four clamps (8) securing
R fire detector wire harness to thrust reverser.
R (i)Remove five screws (5), five nuts (7), and five clamps (8) securing
R harness to top of thrust reverser.
R (j)Remove two screws (11), two nuts (12), and two clamps (13) securing
R harness at pylon interface.
R (k)Disconnect electrical connector D5018P from pylon interface panel.
R Install protective covers on connector and receptacle.
R (2)Remove right side fire detector wire harness (21W4161) (Ref. Fig. 408)
R (a)Disconnect electrical connectors DH3 and DH4 from electrical connectors
R JH3 and JH4 at fire detector assembly. Install protective covers on
R connector and receptacle.
R (b)Disconnect GD9972DC ground wire (1) from grounding stud at fire
R detector assembly. Retain washer (2) and nut (3) for re-installation.
R (c)Remove seven screws (5) and seven clamps (4) securing wire harness
R to thrust reverser inner V-groove ring.
R (d)Remove four screws (5), four nuts (7) and four clamps (6) securing
R wire harness to brackets on upper forward edge of inner thrust
R reverser wall.
R (e)Remove four screws (8) securing cover plate (9) to thrust reverser
R fireseal feedthrough on upper bifurcation wall.
R (f)Remove four screws (5), four nuts (7), and four clamps (6) securing
R fire detector wire harness to thrust reverser.
R (g)Remove five screws (5), five nuts (7), and five clamps (6) securing
R harness to top of thrust reverser.
R (h)Remove four screws (10), four nuts (11), and four clamps (12) securing
R harness at pylon interface.
R (i)Disconnect electrical connector D5019P from pylon interface panel.
R Install protective covers on electrical connector and receptacle.

PRE SB PW4NAC 78-55
C. Installation (Ref. Fig. 401, 402, 403)
(Ref. Fig. 404, 405, 406)
(1)Install left fire detector wire harness (21W4122) (Ref. Fig. 401).
(a)Remove protective covers and connect electrical connectors DH1 and

DH2 to fire detector assembly receptacles. Tighten fingertight plus one-eighth turn.

(b) Install nut (1) and washer (2) attaching ground wire 9971 to support bracket ground stud. TORQUE nut to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(c) Install four screws (3), washers (4) and nuts (5) attaching four wire harness lugs to thrust reverser door. Insert screws from far side. TORQUE nuts to between 50 and 70 lbf.in. (0.57 and 0.79 m.daN).

(d) Install screw (6) attaching clamp (7) to thrust reverser door. TORQUE screw to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(e) Install screw (8) attaching clamp (9) to thrust reverser door. TORQUE screw to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(f) Install screw (10) attaching clamp (11) to thrust reverser door. TORQUE screw to between 20 and 25 lbf. in. (0.23 and 0.28 m.daN).

(g) Install four screws (12), eight washers (13) and four nuts (14) attaching electrical receptacle D5016J to mounting bracket.

(h) If harness 21W4148 is installed, remove protective covers and connect electrical connector D5016P to receptacle D5016J. Tighten fingertight plus one-eighth turn.

(2) Install left T/R fire detector wire harness (21W4148).

(a) Remove protective covers and connect electrical connector D5018P to receptacle D5018J. Tighten fingertight plus one-eighth turn. (Ref. Fig. 403)

(b) Remove protective covers and connect electrical connector D5016P to receptacle D5016J. Tighten fingertight plus one-eighth turn. (Ref. Fig. 402)

(c) From bottom of harness, place clamp (3) on harness 21W4148 and attach clamp to bracket with screw (6) and nut (7), 10 places. TORQUE nut to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(d) Place clamp (3) on harness and attach clamp to brackets with screw (6) and nut (7), 13 places. Make certain that the clamps holding harnesses 21W4082 and 21W4146 are reattached with the same hardware. TORQUE nut to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(e) Insert harness 21W4148 in clamp holding harnesses 21W4082 and 21W4146 and reattach clamp to bracket, four places. TORQUE nut to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(3) Install right fire detector wire harness (21W4124) (Ref. Fig. 404).

(a) Remove protective covers and connect electrical connectors DH3 and DH4 to fire detector assembly receptacles. Tighten fingertight plus one-eighth turn.

(b) Install nut (1) and washer (2) attaching ground wire 9972 to support bracket ground stud. TORQUE nut to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(c) Install four screws (3), washers (4) and nuts (5) attaching four wire harness lugs to thrust reverser door. Insert screws from far side. TORQUE nuts to between 50 and 70 lbf.in. (0.57 and 0.79 m.daN).

(d) Install screw (6) attaching clamp (7) to thrust reverser door. TORQUE screw to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(e) Install screw (8) attaching clamp (9) to thrust reverser door. TORQUE screw to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(f) Install screw (10) attaching clamp (11) to thrust reverser door. TORQUE

screw to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(g)Install four screws (12), eight washers (13) and four nuts (14) attaching electrical receptacle D5017J to mounting bracket.

(h)If harness 21W4152 is installed, remove protective covers and connect electrical connector D5016P to receptacle D5016J. Tighten fingertight plus one-eighth turn.

(4)Install right T/R fire detector wire harness (21W4152).

(a)Remove protective covers and connect electrical connector D5019P to receptacle D5019J. Tighten fingertight plus one-eighth turn. (Ref. Fig. 406)

(b)Remove protective covers and connect electrical connector D5017P to receptacle D5017J. Tighten fingertight plus one-eighth turn. (Ref. Fig. 405)

(c)From bottom of harness, place clamp (3) on harness 21W4152 and attach clamp to bracket with screw (6) and nut (7), 11 places. TORQUE nut (7) to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(d)Place clamp (3) on harness and attach clamp to brackets with screw (6) and nut (7), 11 places. Make certain that the clamps holding harnesses 21W4080 and 21W4144 are reattached with the same hardware. TORQUE nut (7) to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(e)Place clamp (4) on harness and attach clamp to brackets with screw (6) and nut (7), 2 places. Ensure the clamps holding harnesses 21W4080 and 21W4144 are reattached with the same hardware. TORQUE nut (7) to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(f)Insert harness 21W4152 in clamp holding harnesses 21W4082 and 21W4146 and reattach clamp to bracket. TORQUE nut (7) to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(g)Place clamp (4) on harness and attach clamp to brackets with screw (6) and nut (7), 2 places. Make certain that the clamps holding harnesses 21W4080 and 21W4144 are reattached with the same hardware. TORQUE nut (7) to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

(h)Using Material No.P05-052 (5), tie harness 21W4152 to harnesses 21W4080 and 21W4144, two places.

R POST SB PW4 NAC 78-55

R C. Installation

R (1)Install left fire detector wire harness (21W4160) (Ref. Fig. 407)

R (a)Remove protective covers and connect electrical connectors DH1 and DH2 to fire detector assembly receptacles. Tighten connectors fingertight plus one-eighth turn.

R (b)Install nut (3) and washer (2) attaching ground wire GD9971DC (1) to support bracket ground stud. TORQUE nut to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

R (c)Install two clamps (4) securing wire harness to brackets on forward edge of lower inner thrust reverser wall with two screws (5). TORQUE screws to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

R (d)Install five clamps (4) using screws (6), and nuts (7) to secure wire harness to brackets around the precooler duct. TORQUE screws to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).

R (e)Install four clamps (4) using screws (5) to secure wire harness to brackets along forward upper thrust reverser wall. TORQUE screws to

R between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).
R (f)Install clamp (4) using screw (5) and nut (7) to secure wire harness
R to top forward inner wall prior to intersection with nacelle cooling
R harness. TORQUE nut to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).
R (g)Align fire detector wire harness in cutout area of seal block.
R Install four screws (9) securing cover plate (10). TORQUE screws
R to between 12 and 15 lbf.in. (0.13 and 0.17 m.daN). Using Material
R No.P09-037 fill any cavities in seal block.
R (h)Install four clamps (8) using screws (5) and nuts (7) to secure wire
R harness to thrust reverser. TORQUE screws to between 20 and 25 lbf.in.
R (0.23 and 0.28 m.daN).
R (i)Install five clamps (8) using screws (5) and nuts (7) to secure
R wire harness to top of thrust reverser. TORQUE screws to between 20
R and 25 lbf.in. (0.23 and 0.28 m.daN).
R (j)Install two clamps (13) using screws (11) and nuts (12) to secure
R wire harness at pylon interface.
R (k)Remove protective covers and connect electrical connector D5018P
R to pylon interface panel. Tighten connector fingertight plus one-
R eighth turn.
R (2)Install right fire detector wire harness (21W4161) (Ref. Fig. 408)
R (a)Remove protective covers and connect electrical connectors DH3
R and DH4 to fire detector assembly receptacles. Tighten connectors
R fingertight plus one-eighth turn.
R (b)Install nut (3) and washer (2) attaching ground wire GD9972DC
R (1) to support bracket ground stud. TORQUE nut to between 20
R and 25 lbf.in. (0.23 and 0.28 m.daN).
R (c)Install seven clamps (4) securing wire harness to brackets on forward
R edge of lower inner thrust reverser wall with seven screws (5).
R TORQUE screws to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).
R (d)Install four clamps (6) using screws (5), and nuts (7) to secure
R wire harness to brackets on thrust reverser inner V-groove ring.
R TORQUE screws to between 20 and 25 lbf.in. (0.23 and 0.28 m.daN).
R (e)Align fire detector wire harness in cutout area of seal block.
R Install four screws (8) securing cover plate (9). TORQUE screws to
R between 12 and 15 lbf.in. (0.13 and 0.17 m.daN). Using Material
R No.P09-037 fill any cavities in seal block.
R (f)Install four clamps (6) using screws (5) and nuts (7) to secure wire
R harness to thrust reverser. TORQUE screws to between 20 and
R 25 lbf.in. (0.23 and 0.28 m.daN).
R (g)Install five clamps (6) using screws (5) and nuts (7) to secure
R wire harness to top of thrust reverser. TORQUE screws to between
R 20 and 25 lbf.in. (0.23 and 0.28 m.daN).
R (h)Install four clamps (12) using screws (10) and nuts (11) to secure wire
R harness at pylon interface.
R (i)Remove protective covers and connect electrical connector D5019P
R to pylon interface panel. Tighten connector fingertight plus one-
R eighth turn.

D. Close-Up
(1)Make certain that working area is clean and clear of tools and miscel-
laneous items of equipment.

(2)Connect the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(3)Remove access platforms.
(4)Close thrust reverser cowl doors (Ref. 71-13-00, P. Block 301).
(5)Remove safety clips and tags and close circuit breakers.

## ENGINE FIRE CONTROL MODULE - REMOVAL/INSTALLATION

### 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Blanking Caps |
| B. | Circuit Breaker Safety Clips. |
| Referenced Procedures | |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 21-21-00, P. Block 301 | Electronics Racks Air Distribution/Extraction |
| - 26-21-00, P. Block 501 | Engine Fire Extinguishing |
| - 36-11-19, P. Block 401 | Pneumatic Controller |
| - 36-11-00, P. Block 501 | Engine Bleed Air Supply System |

### 2. Procedure

(Ref. Fig. 401)

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 133VU | ENGINES/ENG 1 & 2/FIRE EXTING/SQUIB A/BTL 1 | 1WE | 335/R71 |
| 133VU | ENGINES/ENG 1 & 2/FIRE EXTING/SQUIB A/BTL 2 | 3WE | 335/R72 |
| 22VU | FIRE EXTING/ENG 1 & 2/SQUIB B/BTL 1 | 5WE | 207/C19 |
| 22VU | FIRE EXTING/ENG 1 & 2/SQUIB B/BTL 2 | 7WE | 207/C20 |
| 132VU | ANTI ICE/WING ANTI-ICE/CTL & WARN | 1DM | 321/P70 |

(2)For removal of control module 39WD, open the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 133VU | ELEC/GCU WARN/GEN1 | 5XU | 333/T81 |
| 133VU | HYDRAULIC/ENG1 & 2/FIRE VALVES | 101GK | 334/S57 |
| 132VU | FUEL/LP VALVES/ENG 1 MOTOR 1 | 1QG | 323/M53 |
| 22VU | FUEL/LP VALVES/MOTOR 2 ENG 1 | 3QG | 201/J19 |
| 22VU | AIR BLEED/ENG 1 CONTROLLER/MONITOR | 5HA | 209/A17 |
| 22VU | AIR BLEED/ENG 1 CONTROLLER/CTL | 7HA | 209/A18 |

(3)For removal of control module 40WD, open the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 133VU | ELEC/GCU WARN/GEN2 | 6XU | 333/T82 |
| 133VU | HYDRAULIC/ENG 1 & 2/FIRE VALVES | 103GK | 334/S58 |

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 132VU | FUEL/LP VALVES/ENG 2 MOTOR 1 | 2QG | 332/N54 |
| 22VU | FUEL/LP VALVES/MOTOR 2 ENG 2 | 4QG | 201/J20 |
| 131VU | AIR BLEED/ENG 2 CONTROLLER/ MONITOR | 6HA | 315/D54 |
| 131VU | AIR BLEED/ENG 2 CONTROLLER/CTL | 8HA | 315/D53 |

B. Removal
(1)Rotate the QAD fasteners (1) one quarter of a turn, while holding the module.
(2)Remove the module from its housing.
(3)Disconnect plugs (2) from module connector.
(4)Install blanking caps on plugs and connectors.

C. Installation
(1)Uncap plugs (2) and connectors
(2)Connect plugs (2) to module connectors.
(3)Install module in its housing.
(4)Hold the module and rotate QAD fasteners (1) one quarter of a turn.

D. Test
Disconnect plug 24 (23) WE-A from fire extinguisher bottle 1 and plug 26 (25) WE-A from fire extinguisher bottle 2 in engine pylon.
Remove pneumatic controller 41HA (42HA) from shelf 96VU (91VU) zone 122 (Ref. 36-11-19, P. Block 401).
(1)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301). Make certain that the electronics racks are ventilated (Ref. 21-21-00, P. Block 301).
(2)On ENG 1 and 2 FIRE control modules
- check that ENG 1 FIRE and ENG 2 FIRE handles are pushed (in).
(3)On ENG START section of panel 429VU
- check that ENG START selector switch is in OFF position and that START 1 and START 2 pushbutton switches are released.
(4)Remove safety clips and tags and close the following circuit breakers :
(a)For ENG 1 FIRE control module (39WD) : 5XU, 101GK, 1QG, 3QG, 5HA, 7HA, 1WE, 3WE, 5WE, 7WE and 1DM.
(b)For ENG 2 FIRE control module (40WD) : 6XU, 103GK, 2QG, 4QG, 6HA, 8HA, 1WE, 3WE, 5WE, 7WE and 1DM.
(5)Make certain that the following circuit breakers are closed :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | COMPT TEMP/PACK 1/WARN | 201HB | 203/G21 |
| 22VU | COMPT TEMP/PACK 1/VALVE | 7HB | 203/G22 |
| 22VU | COMPT TEMP/PACK 2/WARN | 200HB | 203/G25 |
| 22VU | COMPT TEMP/PACK 2/VALVE | 6HB | 203/G24 |
| 22VU | AIR BLEED/X FEED VALVE/WARN | 1HV | 203/G17 |
| 22VU | AIR BLEED/X FEED VALVE/MAN CTL | 3HV | 203/G18 |
| 132VU | LIGHTING/MAINT PANEL/ANN & MFA | 22WB | 324/L79 |
| 133VU | ENGINES/ENG 1 & 2/FIRE | 1WE | 335/R71 |

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| | EXTING/SQUIB A/BTL 1 | | |
| 133VU | ENGINES/ENG 1 & 2/FIRE | 3WE | 335/R72 |
| | EXTING/SQUIB A/BTL 2 | | |
| 22VU | FIRE EXTING/ENG 1 & 2/SQUIB B/BTL 1 | 5WE | 207/C19 |
| 22VU | FIRE EXTING/ENG 1 & 2/SQUIB B/BTL 2 | 7WE | 207/C20 |
| - After removal of control module 39WD : | | | |
| 133VU | HYDRAULIC/ENG1 & 2/FIRE VALVES | 101GK | 334/S57 |
| 132VU | FUEL/LP VALVES/ENG 1 MOTOR 1 | 1QG | 323/M53 |
| 132VU | FUEL/LP VALVES/ENG 1 POS ANN | 5QG | 322/N53 |
| 22VU | AIR BLEED/ENG1 WARN | 9HA | 203/G15 |
| 22VU | ENG FIRE DET/ENG 1/LOOP A | 1WD | 209/A19 |
| 22VU | ENG FIRE DET/ENG 1/LOOP B | 3WD | 209/A20 |
| 22VU | ENG FIRE DET/ENG 1/WARN | 5WD | 209/A21 |
| - After removal of control module 40WD : | | | |
| 133VU | HYDRAULIC/ENG 1 & 2/FIRE VALVES | 103GK | 334/S58 |
| 132VU | FUEL/LP VALVES/ENG 2 MOTOR 1 | 2QG | 322/N54 |
| 132VU | FUEL/LP VALVES/ENG 2 POS ANN | 6QG | 323/M54 |
| 131VU | AIR BLEED/ENG 2/WARN | 10HA | 312/G54 |
| 22VU | ENG FIRE DET/ENG 2/LOOP A | 2WD | 209/A24 |
| 22VU | ENG FIRE DET/ENG 2/LOOP B | 4WD | 209/A23 |
| 22VU | ENG FIRE DET/ENG 2/WARN | 6WD | 209/A22 |

| ACTION | RESULT |
|---|---|
| On panel 472VU<br>- place ANN LT switch in READ position | On HYD PWR panel 471VU<br>- OPEN legend of HYD PWR/FIRE VALVES/B G ENG1 comes on.<br>- OPEN legend of HYD PWR/FIRE VALVES/G Y ENG 2 comes on. |
| On panels 470VU, 471VU and 472VU<br>- press the MFA RESET pushbutton switches | - all MFA are off. |
| On panel 436VU<br>- press ENG1 (2) BLEED VALVE/AUTO pushbutton switch. | - OFF legend goes off.<br>- green flowbar comes on. |
| On panel 22VU<br>- open, safety and tag circuit breaker 3QG (4QG) J19 (J20). | Motor 2 of ENG 1 (2) LP shut off valve is electrically isolated. |
| On overhead panel ENG1 (2) FIRE control module 39WD (40WD).<br>- press and hold LOOP TEST pushbutton switch.<br>* After 2 or 3.5 sec time delay | On control module 39WD (40WD)<br><br><br>- LOOP A legend comes on. |

| ACTION | RESULT |
|---|---|
| (Ref. LOOP TEST procedure, 26-12-00, P. Block 501). | - LOOP B legend comes on.<br>- Red warning light of ENG 1 (2) FIRE handle comes on.<br><br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights come on.<br>Continuous repetitive chime sounds.<br>On the ECAM display unit message starting with ENG 1 (2) FIRE appears. |
| - pull ENG1(2) fire handle. | Continuous repetitive chime stops.<br>On control module 39WD (40WD).<br>- Both SQUIB legends come on.<br>- LOOP A & LOOP B legends go off.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights come on.<br>ENG 1 LP valve is closed by motor 1.<br>On FUEL panel 430VU<br>- While fuel LP valve is in transit, valve position annunciator is off.<br>- When valve is closed, annunciator SHUT legend comes on.<br>On AIR BLEED panel 436VU<br>- FAULT legend on ENG 1 (2) BLEED VALVE/FAULT/OFF pushbutton switch comes on.<br>- Green flowbar goes off.<br>On HYD PWR panel 471VU<br>- HYD PWR/FIRE VALVES/B/G ENG 1 (G/Y ENG2) pushbutton switch<br>. OPEN legend goes off.<br>. SHUT legend comes on. |
| R | On ELEC PWR panel 472VU<br>- ELEC PWR/GPCU/BITE/DISPLAY MFA comes on. |
| On panel 472VU<br>- place ANN LT switch in OFF position for 2 seconds then return ANN LT switch to read position. | On FUEL panel 472VU<br>- FUEL/LP VALVE/ENG1(2) MFA FAULT legend comes on.<br>(this indicates failure of relay 9QG (10QG) not of the valve). |
| R | In avionics compartment, shelf 96VU (91VU), zone 122<br>- check that an open circuit exists between pins 4A and 14A on rack connector corresponding to pneumatic controller 1 (2) 41HA (42HA). |

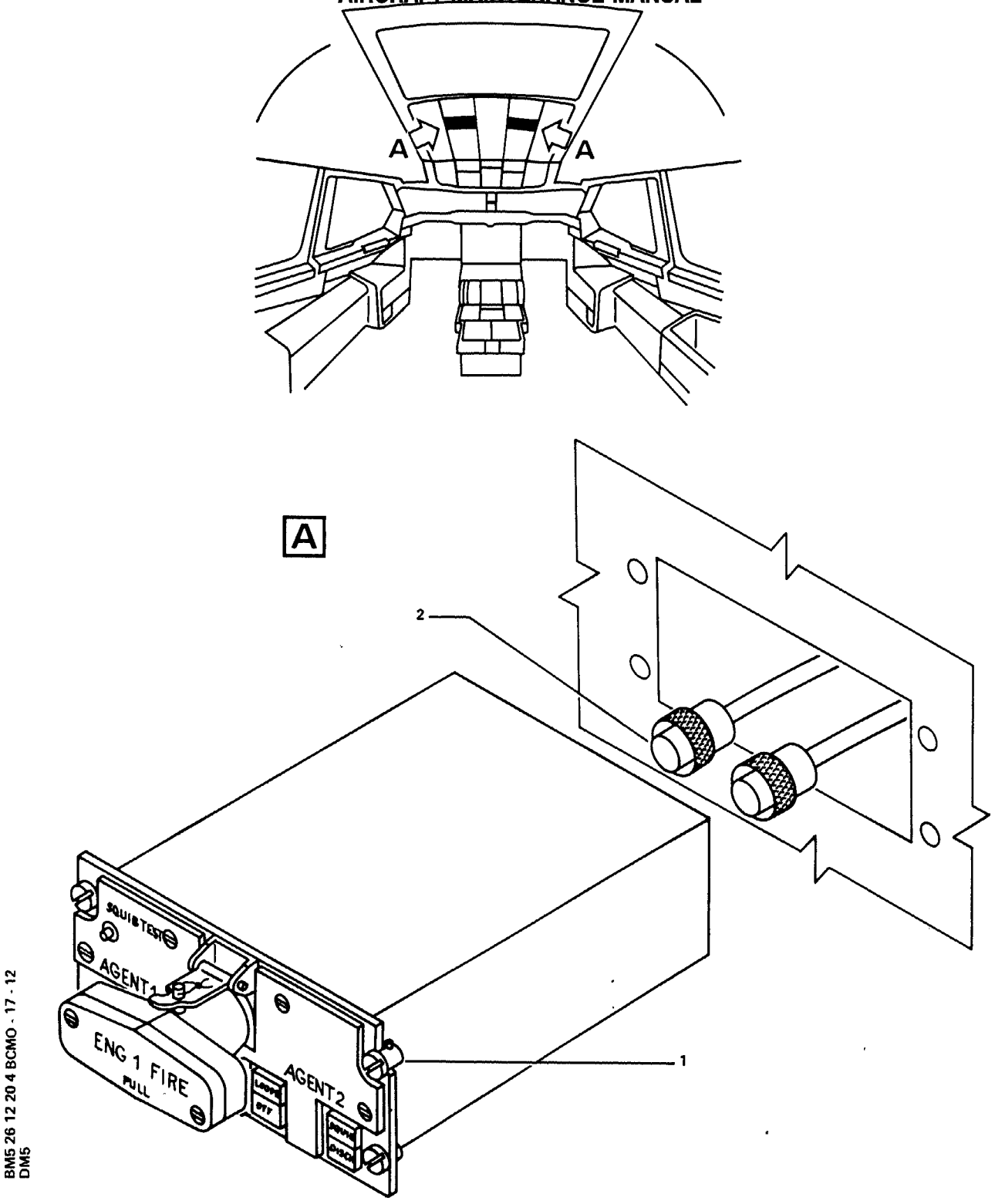
| ACTION | RESULT |
|---|---|
| - release **LOOP TEST** pushbutton switch | On control module **39WD (40WD)**<br>- Red warning light of **ENG 1 (2) FIRE** handle goes off.<br>On **CAPT** and **F/O** main instrument panels **3VU** and **5VU**<br>- **MASTER WARN** lights go off.<br>On **L ECAM** display unit<br>- Message **ENG1 (2) FIRE** disappears. |
| On overhead panel, **ENG1 (2)** control module **39WD (40WD)**<br>- Push **ENG1 (2) FIRE** handle. | On control module **39WD (40WD)**<br>- Both **SQUIB** legends go off.<br>**ENG1 LP** valve opens<br>**ENG1 (2) LP VALVE** is opened by motor 1.<br>On **FUEL** panel **430VU**<br>- While fuel **LP** valve is in transit, valve position annunciator is off.<br>- When valve is open, annunciator flowbar comes on green.<br>On **CAPT** and **F/O** main instrument panels **3VU** and **5VU**<br>- **MASTER CAUTION** lights go off. |
| On **AIR BLEED** panel **436VU**<br>- release and press **ENG1 (2) BLEED VALVE** pushbutton switch (Reset). | On panel **436VU**<br>- **FAULT** legend goes off, green flowbar comes on.<br>On **HYD PWR** panel **471VU**<br>- On **HYD PWR/FIRE VALVES B/G ENG1 (G/Y ENG2)** pushbutton switch<br>. **SHUT** legend goes off.<br>. **OPEN** legend comes on. |
| R - On **GPCU**, press **MEMORY CLEAR**<br>R pushbutton switch. | |
| On panel **472VU**<br>- Press **MFA RESET** pushbutton switch. | On **FUEL** panel **472VU**<br>- **FAULT** legend of the **LP VALVE/ENG 1(2) MFA** goes off.<br>On **ELEC PWR** panel **472VU**<br>- **BITE/DISPLAY** legend of the **GPCU MFA** goes off. |
| - Place **ANN LT** switch in **OFF** position. | On **HYD PWR** panel **471VU**<br>- **OPEN/SHUT** legends of the **FIRE VALVES/B/G ENG1 (G/Y ENG2) ANN** goes off. |
| On panel **22VU**<br>- remove safety clip and tag and close circuit breaker **3QG (4QG) J19 (J20)**. | **LP** valve motor 2 electrically supplied. |

| ACTION | RESULT |
|---|---|
| On panel 132VU<br>- open, safety and tag circuit breaker 1QG (2QG) M53 (N54). | LP valve motor 1 electrically isolated. |
| On overhead panel ENG1 (2) FIRE control module<br>- pull ENG1 (2) fire handle. | ENG1 (2) valve is closed by motor 2.<br>On fuel panel 430VU<br>- While FUEL LP valve is in transit, valve position annunciator is off.<br>- When valve is closed, annunciator SHUT legend comes on. |
| On panel 472VU<br>- place ANN LT switch in READ position.<br>- push ENG1 (2) FIRE handle | On FUEL panel 472VU<br>- FUEL/LP VALVE/ENG 1 (2) MFA FAULT legend comes on.<br>ENG1 (2) LP valve opens.<br>On panel 430VU<br>- While valve is in transit, valve position annunciator is off.<br>- When valve is open, annunciator flowbar comes on green. |
| On panel 132VU<br>- remove safety clip and tag and close circuit breaker 1QG (2QG) M53 (N54). | LP valve motor 1 electrically supplied. |
| On AIR BLEED panel 436VU<br>- release ENG1 (2) BLEED VALVE pushbutton switch | On panel 436VU<br>- FAULT legend goes off.<br>- OFF legend comes on. |
| In avionics compartment 81VU<br>- on GPCU, push and release FAULT ISOLATE pushbutton switch. | In avionics compartment on GPCU.<br>- FIRE TRIP message must appear during readout of messages stored in the non volatile memories of GPCU and three GCU'S. |
| R On GPCU, press MEMORY CLEAR pushbutton<br>R switch. | - MEMORY has been reset. |
| On panel 472VU<br>- Press MFA RESET pushbutton switch and place ANN LT switch in OFF position. | On FUEL panel 472VU<br>- FUEL/LP VALVE/ENG1 (2) MFA FAULT legend goes off. |

E. Close-Up
(1)Connect plug 24 (23) WE-A and 26 (25) WE-A.
- Perform a SQUIB TEST (Ref. 26-21-00, P. Block 501).

(2)Install pneumatic controller 41HA (42HA).
- Perform a BITE TEST (Ref. 36-11-00, P. Block 501).

(3)Restore system and aircraft to normal operating condition.




BM5 26 12 20 4 BCMO - 17 - 12
DM5

ENG FIRE Control Module 39WD (40WD)
Figure 401

(4)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

1. Functional Test

A. Reason for the Job
To check systems controlled by ENG1 (2) FIRE HANDLE.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Blanking Caps |
| B. | Circuit Breaker Safety Clips |
| C. | Voltmeter |
| R D. | Snapwire, 0.3 or 0.4 mm (0.012 or 0.015 in) |
| R | dia. with breaking strenght 2.0 to 3.5 daN |
| R | (4.5 TO 7.9 lbf) |
| Referenced Procedures | |
| - 21-21-00, P. Block 301 | Flight Compartment and Electronics Racks Air Distribution |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 36-11-00, P. Block 501 | Engine Bleed Air Supply System |
| - 36-11-19, P. Block 401 | Pneumatic Controller 41HA (42HA) |
| - 49-00-00, P. Block 501 | Airborne Auxiliary Power or<br>One HP Ground Air Supply Unit capable of :<br>- pressure between 3.1 and 3.4 bars (45 and 50 psi)<br>- air temperature between 50°C and 230°C (122°F and 445°F)<br>- minimum mass flow at 3.05 kg/s. |

C. Procedure
(1)Job set-up
(a)Initial conditions
Disconnect plug 23 (24) WE-A from fire extinguisher bottle 1 and 25 (26) WE-A from fire extinguisher bottle 2 in engine pylon.
Remove pneumatic controller 41HA (42HA) in 96VU (91VU) zone 122 (Ref. 36-11-19, P. Block 401).
Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
Make certain that the electronics racks are ventilated (Ref. 21-21-00, P. Block 301).
On ENG 1 and 2 FIRE control modules
- check that ENG 1 FIRE and ENG 2 FIRE handles are pushed (in).
- lift the tabs locking the ENG1 FIRE and ENG2 FIRE handles (remove the snapwire).

On ENG START section of panel 429VU
- check that ENG START selector switch is in OFF position and that START 1 and START 2 pushbutton switches are released.

On ECAM control panel

- press BLEED pushbutton switch
  . pushbutton switch integral light comes on
  . on R ECAM display unit, AIR BLEED page is displayed.
- using LEFT and RIGHT DISPLAY knobs, adjust brightness on left and right ECAM display units.

On COMPT TEMP panel 437VU
- release PACK VALVE 1 and 2 pushbutton switches (OFF legends on).

On CABIN PRESS panel 432VU
- check that OUTFLOW/FWD and AFT pushbutton switches are pressed (in) (both outflow valves open).

(2)Test

(a)Pneumatic system pressurization using the APU

- start up APU (Ref. 49-00-00, P. Block 501).

| ACTION | RESULT |
|---|---|
| On panel 472VU<br>- place ANN LT switch in READ position | On HYD PWR panel 471VU<br>- OPEN legend of HYD PWR/FIRE VALVES/B/G ENG1 pushbutton switch comes on<br>- OPEN legend of HYD PWR/FIRE VALVES/G/Y ENG2 pushbutton switch comes on. |
| On panels 470VU, 471VU and 472VU<br>- press the 3 MFA RESET pushbutton switches. | - all MFAs are off. |
| On COMPT TEMP panel 437VU<br>- press PACK VALVE 1 (2) pushbutton switch | On panel 437VU<br>- OFF legend on PACK VALVE 1 (2) pushbutton switch goes off<br>- FAULT legend on PACK VALVE 1 (2) pushbutton switch comes on. |
| Pressurize pneumatic system | On panel 437VU<br>- Flowbar on PACK VALVE 1 (2) annunciator comes on<br>- FAULT legend on PACK VALVE 1 (2) pushbutton switch goes off. |
| On AIR BLEED panel 436VU<br>- press ENG 1 (2) HP VALVE pushbutton switch | On panel 436VU<br>- OFF legend goes off |
| - press ENG 1 (2) BLEED VALVE/AUTO pushbutton switch | - OFF legend goes off<br>- green flowbar comes on |
| Using APU<br>- when N APU is higher than 95% | - X feed flowbar is in line (X FEED valve open)<br>- ENG 1 (2) BLEED VALVE/AUTO flowbar goes off. |
| On panel 22VU<br>- open, safety and tag circuit breaker 3QG (4QG) J19 (520) | Motor 2 of ENG 1 (2) LP shut off valve is electrically isolated. |

| ACTION | RESULT |
|---|---|
| On overhead panel **ENG 1 (2) FIRE** control module **39WD (40WD)**<br>- press **LOOP A** and **LOOP B** pushbutton switches<br>- press **LOOP TEST** pushbutton switch<br>* after 2 or 3.5 second time delay (Ref. 26-12-00, P. Block 501- Loop Test Procedure) | On control module **39WD (40WD)**<br>- **OFF** legend on **LOOP A** and **LOOP B** pushbutton switches goes off<br>- **LOOP A** legend comes on<br>- **LOOP B** legend comes on<br>- Red warning light of **ENG 1 (2) FIRE** handle comes on.<br><br>On **CAPT** and **F/O** main instrument panels **3VU** and **5VU**.<br>- **MASTER WARN** lights come on.<br>Continuous repetitive chime sounds.<br>On **ECAM** display unit, message starting with **ENG 1 (2) FIRE** appears. |
| - pull **ENG 1 (2)** fire handle | Continuous repetitive chime stops<br>On control module **39WD (40WD)**<br>- both **SQUIB** legends come on.<br>- **LOOP A & LOOP B** legends go off.<br>On **CAPT** and **F/O** main instrument panels **3VU** and **5VU**<br>- **MASTER CAUTION** lights come on.<br><br>Engine 1 (2) LP valve is closed by motor 1.<br>On **FUEL** panel **430VU**<br>- While **FUEL LP** valve is in transit, valve position annunciator is off<br>- When valve is closed, annunciator **SHUT** legend comes on.<br>On **AIR BLEED** panel **436VU**<br>- **FAULT** legend on **ENG 1 (2) BLEED VALVE/FAULT/OFF** pushbutton switch comes on<br><br>- **X FEED** flowbar is cross line (**X FEED** valve closed)<br>On **COMPT TEMP** panel **437VU**<br>- **FAULT** legend on **PACK VALVE 1 (2)** pushbutton switch comes on<br>- Flowbar on **PACK VALVE 1 (2)** annunciator goes off.<br>On **HYD PWR** panel **471VU**<br>- **HYD PWR/FIRE VALVES/B/G ENG1 (G/Y ENG 2)** pushbutton switch<br>. **OPEN** legend goes off<br>. **SHUT** legend comes on. |

| ACTION | RESULT |
|---|---|
| On panel 472VU<br>- place ANN LT switch in OFF position for 2 sec. then return ANN LT switch to READ position. | On FUEL panel 472VU<br>- FUEL/LP VALVE/ENG 1 (2) MFA FAULT legend comes on (This indicates failure of relay 9QG (10QG) not of the valve)<br>- ELEC PWR/GPCU/BITE/ DISPLAY MFA comes on.<br>In avionics compartment, shelf 96VU (91VU), zone 122<br>- check that an open circuit exists between pins 4A and 14A on rack connector corresponding to pneumatic controller 1 (2) 41HA (42HA). |
| - release LOOP TEST pushbutton switch | On control module 39WD (40WD)<br>- red warning light of ENG1 (2) FIRE handle goes off. |
| In avionics compartment shelf 81VU<br>- On GPCU, push and release FAULT ISOLATE pushbutton switch | In avionics compartment<br>- FIRE TRIP message must appear during the GCU sequence corresponding to the fire handle activated. |
| On overhead panel, ENG 1 (2) control module 39WD (40WD)<br>- press AGENT 1/SQUIB pushbutton switch | In ENG1 (2) pylon<br>On disconnected cartridge connector plug 23 (24) WE-A :<br>- check for 28VDC between terminal A and ground and between terminal B and ground. |
| - release AGENT 1/SQUIB pushbutton switch | - check for 0VDC between terminal A and ground and between terminal B and ground. |
| - press AGENT 2/SQUIB pushbutton switch | On disconnected cartridge connector plug 25(26) WE-A<br>- check for 28VDC between terminal A and ground and between terminal B and ground. |
| - release AGENT 2/SQUIB pushbutton switch | - check for 0VDC between terminal A and ground and between terminal B and ground. |
| On overhead panel, ENG 1 (2) control module 39WD (40WD)<br>- push ENG1 (2) FIRE handle | On control module 39WD (40WD)<br>- both SQUIB legends go off, ENG 1 |

| ACTION | RESULT |
|---|---|
| | (2) LP valve opens.<br>Engine 1 (2) LP VALVE is opened by motor 1.<br>On FUEL panel 430VU<br>- while FUEL LP valve is in transit, valve position annunciator is off<br>- when valve is open, annunciator green flowbar comes on.<br>On COMPT TEMP panel 437VU<br>- FAULT legend on PACK VALVE 1 (2) pushbutton switch goes off<br>- flowbar on PACK VALVE 1 (2) annunciator comes on.<br>On HYD PWR panel 471VU<br>- On HYD PWR/FIRE VALVES/B/G ENG1 (B/Y ENG 2) pushbutton switch<br>. SHUT legend goes off<br>. OPEN legend comes on.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights go off. |
| On AIR BLEED panel 436VU<br>- release and press ENG1 (2) BLEED VALVE pushbutton switch (reset) | On panel 436VU<br>- FAULT legend goes off<br>- X-FEED flowbar is in line (X-FEED valve open) |
| On panel 472VU<br>NOTE : Indicate all the MFA which have come on, other than those activated by the test.<br>- press MFA RESET pushbutton switch | On panel 472VU<br>- ELEC PWR/GPCU/BITE/DISPLAY MFA goes off<br>- FUEL/LP VALVE/ENG 1 (2) MFA goes off. |
| On COMPT TEMP panel 437VU<br>- release PACK VALVE1 (2) pushbutton switch | On panel 437VU<br>- OFF legend on PACK VALVE 1 (2) pushbutton switch comes on<br>- flowbar on PACK VALVE 1 (2) annunciator goes off. |
| - Depressurize pneumatic system | On panel 436VU<br>- X-FEED flowbar is cross line (X-FEED valve closed).<br>- ENG 1 (2) BLEED VALVE/AUTO flowbar comes on. |
| - On fire extinguisher bottles 1 | |

| ACTION | RESULT |
|---|---|
| and 2, connect plugs to their respective cartridge connectors. | |
| On panel 22VU<br>- remove safety clip and tag and close circuit breaker 3QG (4QG) J19 (J20) | LP valve motor 2 electrically supplied |
| On panel 132VU<br>- open, safety and tag circuit breaker 1QG (2QG) M53 (N54) | LP valve motor 1 electrically isolated |
| On panel 426VU<br>- press WING/SUPPLY pushbutton swich. | On panel 426VU<br>- ON legend comes on. |
| On overhead panel ENG 1 (2) FIRE control module 39WD (40WD)<br>- pull ENG 1 (2) FIRE HANDLE | ENG 1 (2) LP valve is closed by motor 2.<br>On FUEL panel 430VU<br>- While fuel LP valve is in transit, valve position annunciator is off<br>- When valve is closed annunciator SHUT legend comes on.<br>On FUEL panel 472VU<br>- FUEL/LP VALVE/ENG 1 (2)/FAULT MFA comes on (this indicates failure of relay 11QG (12QG), not of the valve).<br>On panel 426VU<br>- MODE SEL FAULT light comes on. |
| - push ENG 1 (2) FIRE handle | ENG 1 (2) LP valve opens<br>On FUEL panel 430VU<br>- While fuel LP valve is in transit, valve position annunciator is off<br>- When valve is open annunciator green flowbar comes on.<br>On panel 426VU<br>- MODE SEL FAULT light goes off. |
| On panel 132VU<br>- remove safety clip and tag and close circuit breaker 1QG (2QG) M53 (N54) | LP valve motor 1 electrically supplied. |
| On panel 426VU<br>- release WING/SUPPLY pushbutton switch. | - ON legend goes off. |

| ACTION | RESULT |
|---|---|
| On AIR BLEED panel 436VU<br>- release ENG1 (2) BLEED VALVE pushbutton switch | On panel 436VU<br>- FAULT legend goes off.<br>- OFF legend comes on. |
| In avionics compartment shelf 81VU<br>- on GPCU, push and release FAULT ISOLATE pushbutton switch | In avionics compartment. On GPCU.<br>- FIRE TRIP message must appear during reading of messages stored in the nonvolatile memories of the GPCU and three GCU's. |
| - on GPCU, press MEMORY CLEAR pushbutton switch | - memory that has been cleared appears. |
| On panel 472VU<br>- press MFA RESET pushbutton switch | On panel 472VU<br>- FUEL/LP VALVE/ENG 1 (2)/FAULT MFA goes off<br>- GPCU BITE display goes off. |
| On panel 472VU<br>- place ANN LT switch in OFF position | On HYD PWR panel 471VU<br>- OPEN legend of HYD PWR/FIRE VALVES B/G ENG1 (G/Y ENG2) pushbutton switch goes off. |

(b)Pneumatic system pressurization using HP ground pneumatic source
- connect HP ground air supply unit to HP ground connector

NOTE 1 : To carry out this procedure and to test the right refrigeration unit pack only, open the crossfeed valve as follows :
- released X-FEED pushbutton switch (MAN legend on)
- press X-FEED valve position pushbutton switch (flowbar in line).

| ACTION | RESULT |
|---|---|
| On panel 472VU<br>- place ANN LT switch in READ position | On HYD PWR panel 471VU<br>- OPEN legend of HYD PWR/FIRE VALVES/B/G ENG1 pushbutton switch comes on<br>- OPEN legend of HYD PWR/FIRE VALVES/G/Y ENG2 pushbutton switch comes on. |
| On panels 470VU, 471VU and 472VU<br>- press the three MFA RESET pushbutton switches | - all MFAs are off. |
| On COMPT TEMP panel 437VU<br>- press PACK VALVE 1 (2) pushbutton switch | On panel 437VU<br>- OFF legend on PACK VALVE 1 (2) pushbutton switch goes off<br>- FAULT legend on PACK VALVE 1 (2) pushbutton switch comes on. |
| Pressurize pneumatic system<br>(Ref. NOTE 1) | On panel 437VU<br>- Flowbar on PACK VALVE 1 (2) |

| ACTION | RESULT |
|---|---|
| | annunciator comes on<br>- FAULT legend on PACK VALVE 1 (2) pushbutton switch goes off. |
| On AIR BLEED panel 436VU<br>- press ENG 1 (2) HP VALVE pushbutton switch | On panel 436VU<br>- OFF legend goes off |
| - press ENG 1 (2) BLEED VALVE/AUTO pushbutton switch | - OFF legend goes off<br>- green flowbar comes on |
| On panel 22VU<br>- open, safety and tag circuit breaker 3QG (4QG) J19 (J20) | Motor 2 of ENG 1 fuel LP valve is electrically isolated. |
| On overhead panel ENG 1 (2) FIRE control module 39WD (40WD)<br>- press LOOP A and LOOP B pushbutton switches<br>- press LOOP TEST pushbutton switch<br>* after 2 or 3.5 second time delay (Ref. 26-12-00, P. Block 501-Loop Test Procedure) | On control module 39WD (40WD)<br>- OFF legend on LOOP A and LOOP B pushbutton switches goes off<br>- LOOP A legend comes on<br>- LOOP B legend comes on<br>- Red warning light of ENG 1 (2) FIRE handle comes on.<br>- ON CAPT and F/O main instrument panels 3VU and 5VU.<br>- Master WARN lights come on.<br>Continuous repetitive chime sounds.<br>On ECAM display unit, message starting with ENG 1 (2) FIRE appears. |
| - pull ENG 1 (2) fire handle | Continuous repetitive chime stops<br>On control module 39WD (40WD)<br>- both SQUIB legends come on.<br>- LOOP A & LOOP B legends go off.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights come on.<br>Engine 1 LP valve is closed by motor 1.<br>On FUEL panel 430VU<br>- While fuel LP valve is in transit, valve position annunciator is off<br>- When valve is closed, annunciator SHUT legend comes on.<br>On AIR BLEED panel 436VU<br>- FAULT legend on ENG 1 (2) BLEED VALVE pushbutton switch comes on |

| ACTION | RESULT |
|---|---|
| | - green flowbar goes off.<br>On COMPT TEMP panel 437VU<br>- FAULT legend on PACK VALVE 1 (2) pushbutton switch comes on<br>- Flowbar on PACK VALVE 1 (2) annunciator goes off.<br>On HYD PWR panel 471VU<br>- HYD PWR/FIRE VALVES/B/G ENG1 (G/Y ENG2)<br>. OPEN legend goes off<br>. SHUT legend comes on. |
| On panel 472VU<br>- place ANN LT switch in OFF position for 2 sec. then replace ANN LT switch in READ position | On FUEL panel 472VU<br>- FUEL/LP VALVE/ENG 1 (2) FAULT MFA comes on<br>(This indicates failure of relay 9QG (10QG) not of the valve)<br>- ELEC PWR/GPCU/BITE/ DISPLAY MFA comes on.<br>In avionics compartment, shelf 96VU (91VU), zone 122<br>- check that an open circuit exists between pins 4A and 14A on rack connector corresponding to pneumatic controller 1 (2) 41HA (42HA). |
| - release LOOP TEST pushbutton switch | On control module 39WD (40WD)<br>- red warning light of ENG 1 (2) FIRE handle goes off. |
| In avionics compartment shelf 81VU<br>- On GPCU, push and release FAULT ISOLATE pushbutton switch | In avionics compartment<br>- FIRE TRIP message must appear during the GCU sequence corresponding to the fire handle activated. |
| On overhead panel, ENG 1 (2) control module 39WD (40WD)<br>- press AGENT 1/SQUIB pushbutton switch | In ENG1 (2) pylon<br>On disconnected cartridge connector plug 23 (24) WE-A :<br>- check for 28VDC between terminal A and ground and between terminal B and ground. |
| - release AGENT 1/SQUIB pushbutton switch | - check for 0VDC between terminal A and ground and between terminal B and ground. |
| - press AGENT 2/SQUIB pushbutton | On disconnected cartridge connector |

| ACTION | RESULT |
|---|---|
| switch | plug 25(26) WE-A<br>- check for 28VDC between terminal A and ground and between terminal B and ground. |
| - release AGENT 2/SQUIB pushbutton switch | - check for 0VDC between terminal A and ground and between terminal B and ground. |
| On overhead panel, ENG 1 (2) control module 39WD (40WD)<br>- push ENG1 (2) FIRE handle | On control module 39WD (40WD)<br>- both SQUIB legends go off, ENG 1 (2) fuel LP valve opens.<br>Engine 1 (2) LP VALVE is opened by motor 1.<br>On FUEL panel 430VU<br>- while fuel LP valve is in transit, valve position annunciator is off<br>- when valve is open, annunciator green flowbar comes on.<br>On COMPT TEMP panel 437VU<br>- FAULT legend on PACK VALVE 1 (2) pushbutton switch goes off<br>- flowbar on PACK VALVE 1 (2) annunciator comes on.<br>On HYD PWR panel 471VU<br>- On HYD PWR/FIRE VALVES/B/G ENG1 (B/Y ENG2) pushbutton switch<br>. SHUT legend goes off<br>. OPEN legend comes on.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights go off. |
| On AIR BLEED panel 436VU<br>- release and press ENG1 (2) BLEED VALVE pushbutton switch (reset) | On panel 436VU<br>- FAULT legend goes off, green flowbar comes on. |
| On panel 472VU<br>NOTE : Indicate all the MFAs which have come on, other than those activated by the test.<br>- press MFA RESET pushbutton switch | On panel 472VU<br>- ELEC PWR/GPCU/BITE/DISPLAY MFA goes off<br>- FUEL/LP VALVE/ENG 1 (2) MFA goes off. |
| On COMPT TEMP panel 437VU | On panel 437VU |

| ACTION | RESULT |
|---|---|
| - release PACK VALVE1 (2) pushbutton switch | - OFF legend on PACK VALVE 1 (2) pushbutton switch comes on<br>- flowbar on PACK VALVE 1 (2) annunciator goes off. |
| - Depressurize pneumatic system | |
| On AIR BLEED section of panel 436VU<br>- make certain that X-FEED MODE pushbutton switch is selected AUTO<br>- On fire extinguisher bottles 1 and 2, connect plugs to their respective cartridge connectors. | On panel 436VU<br>- flowbar on X-FEED valve position pushbutton switch is cross line |
| On panel 22VU<br>- remove safety clip and tag and close circuit breaker 3QG (4QG) J19 (J20) | LP valve motor 2 electrically supplied |
| On panel 132VU<br>- open, safety and tag circuit breaker 1QG (2QG) M53 (N54) | LP valve motor 1 electrically isolated |
| On panel 426VU<br>- press WING/SUPPLY pushbutton switch. | On panel 426VU<br>- ON legend comes on. |
| On overhead panel ENG 1 (2) FIRE control module 39WD (40WD)<br>- pull ENG 1 (2) FIRE HANDLE | ENG 1 (2) LP valve is closed by motor 2.<br>On FUEL panel 430VU<br>- While fuel LP valve is in transit, valve position annunciator is off<br>- When valve is closed annunciator SHUT legend comes on.<br>On FUEL panel 472VU<br>- FUEL/LP VALVE/ENG 1 (2)/FAULT MFA comes on (this indicates failure of relay 11QG (12QG), not of the valve).<br><br>On panel 426VU<br>- MODE SEL FAULT light comes on. |
| - push ENG 1 (2) FIRE handle | ENG 1 (2) LP valve opens<br>On FUEL panel 430VU<br>- While fuel LP valve is in transit, valve position annunciator is off<br>- When valve is open annunciator |

| ACTION | RESULT |
|---|---|
| | green flowbar comes on.<br>On panel 426VU<br>- MODE SEL FAULT light goes off. |
| On panel 132VU<br>- remove safety clip and tag and close circuit breaker 1QG (2QG) M53 (N54) | LP valve motor 1 electrically supplied. |
| On panel 426VU<br>- release WING/SUPPLY pushbutton switch. | - ON legend goes off. |
| On AIR BLEED panel 436VU<br>- release ENG1 (2) BLEED VALVE pushbutton switch | On panel 436VU<br>- FAULT legend goes off.<br>- OFF legend comes on. |
| In avionics compartment shelf 81VU<br>- on GPCU, push and release FAULT ISOLATE pushbutton switch | In avionics compartment. On GPCU.<br>- FIRE TRIP message must appear during reading of messages stored in the non volatile memories of the GPCU and three GCUs. |
| - on GPCU, press MEMORY CLEAR pushbutton switch | - memory that has been cleared appears. |
| On panel 472VU<br>- press MFA RESET pushbutton switch | On panel 472VU<br>- FUEL/LP VALVE/ENG 1 (2)/FAULT MFA goes off<br>- GPCU/BITE DISPLAY MFA goes off. |
| On panel 472VU<br>- place ANN LT switch in OFF position | On HYD PWR panel 471VU<br>- OPEN legend of HYD PWR/FIRE VALVES B/G ENG1 (G/Y ENG2) pushbutton switches goes off. |

D. Close-Up

(1)Lock the ENG1 FIRE and ENG2 FIRE handles by lowering the tabs and
R place new snapwire.
(2)Install pneumatic controller 41HA (42HA) and carry out BITE test (Ref. 36-11-00, P. Block 501).
(3)Install plugs 23 (24) WE-A and 25 (26) WE-A and carry out a SQUIB test.
(4)Shut down air supply
- From APU (Ref. 49-00-00, P. Block 501)
- From HP ground connectors, shut down and disconnect HP ground air supply unit.

(5)Restore system and aircraft to normal operating condition.

(6)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

## APU FIRE AND OVERHEAT DETECTION - DESCRIPTION AND OPERATION

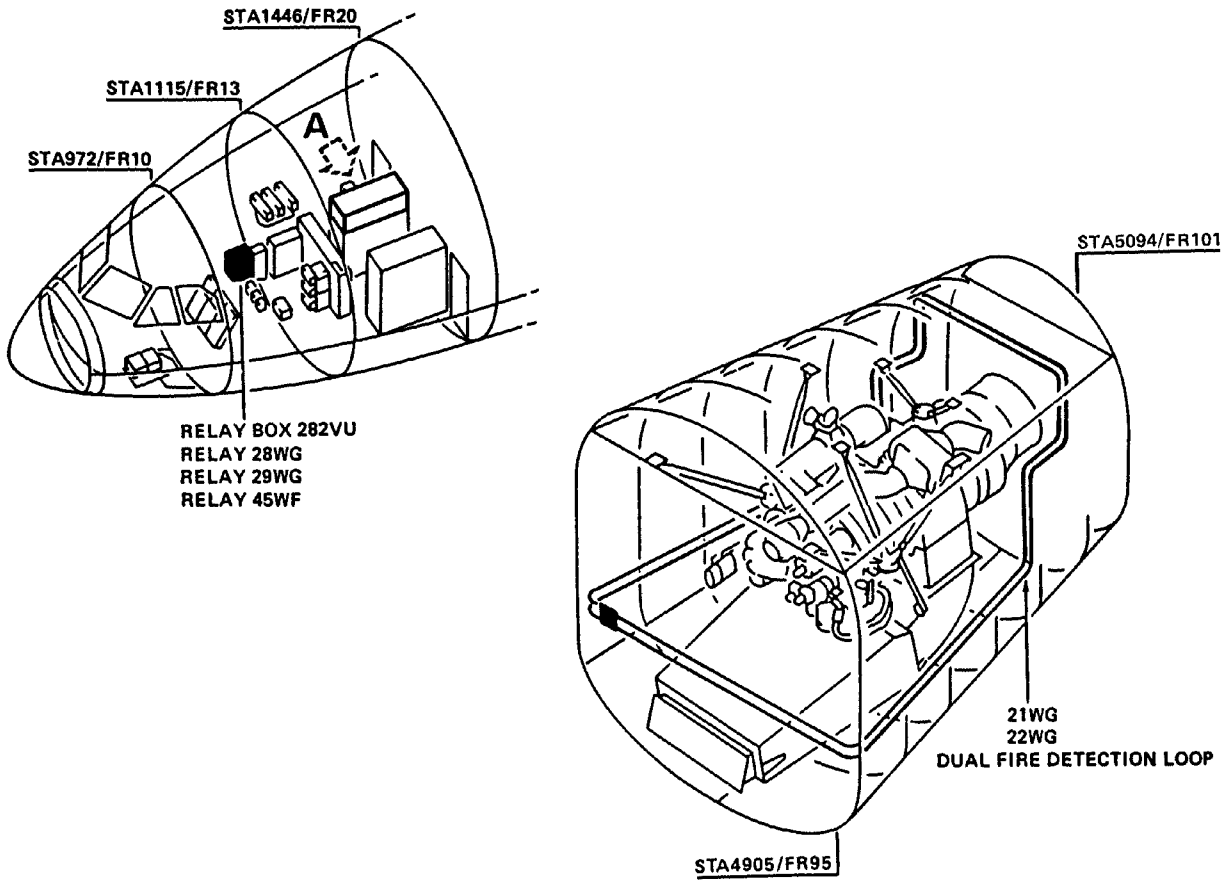
### 1. General

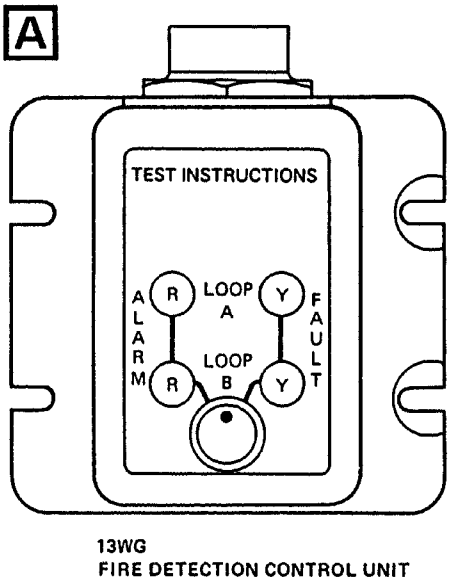
The system detects and indicates fire or overheat in the APU compartment by means of two independent fire warning loops.
When an excessive temperature is detected, visual and aural signals are provided in the flight compartment, so that an extinguishing sequence can be initiated immediately.
During ground operation of the APU the extinguishing sequence is initiated automatically.
Every extinguishing sequence is combined with an APU shutdown.

### 2. Component Location

(Ref. Fig. 001)
R (Ref. Fig. 002)
(Ref. Fig. 003)

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 13WG | FIRE DETECTION CONTROL UNIT | 91VU | 121 | 132AZ | 26-13-11 |
| 20WG | MODULE-APU FIRE CONTROL | 20VU | 210 | | 26-13-20 |
| 21WG | LOOP A | | 315 | 315AL | 26-13-12 |
| | | | 316 | 316AR | |
| 22WG | LOOP B | | 315 | 315AL | 26-13-12 |
| | | | 316 | 316AR | |
| 24WG | DIODE | 302VT | 210 | | |
| 25WG | DIODE | 302VT | 210 | | |
| 26WG | DIODE | 302VT | 210 | | |
| 27WG | DIODE | 302VT | 210 | | |
| 28WG | RELAY-SQUIB TEST FAULT LOOP A | 282VU | 122 | | |
| 29WG | RELAY-SQUIB TEST FAULT LOOP B | 282VU | 122 | | |
| 31VD | DIODE | 90VU | 121 | | |
| 3WC | INTERPHONE BOX | | 711 | | 23-42-12 |
| 45WF | RELAY-SQUIB INDICATION RELAY | 282VU | 122 | | |

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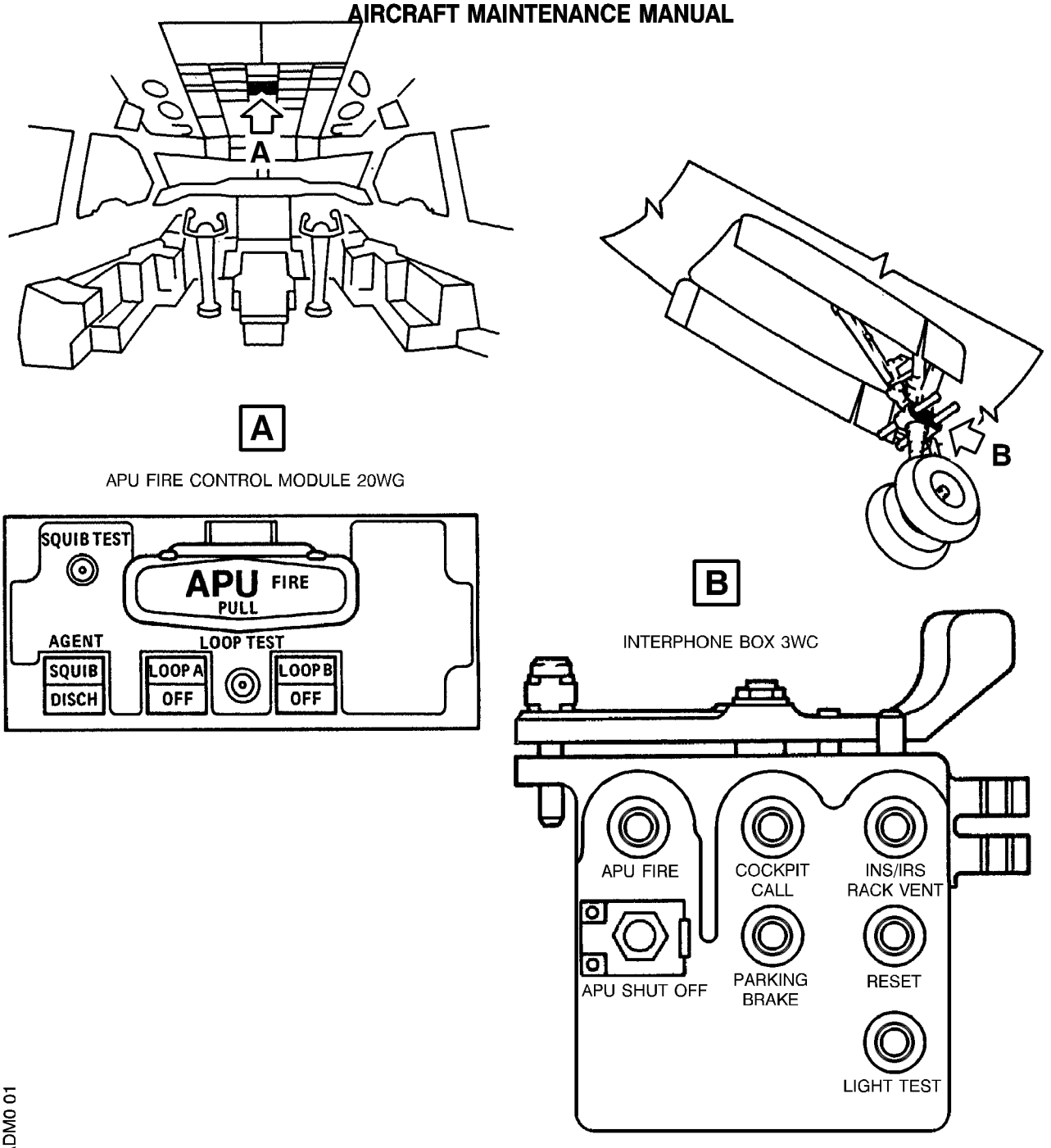
Fire and Overheat Detection - Component Location
Figure 001

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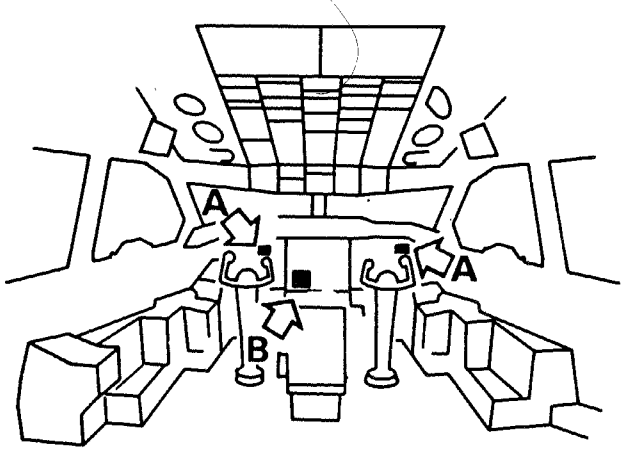
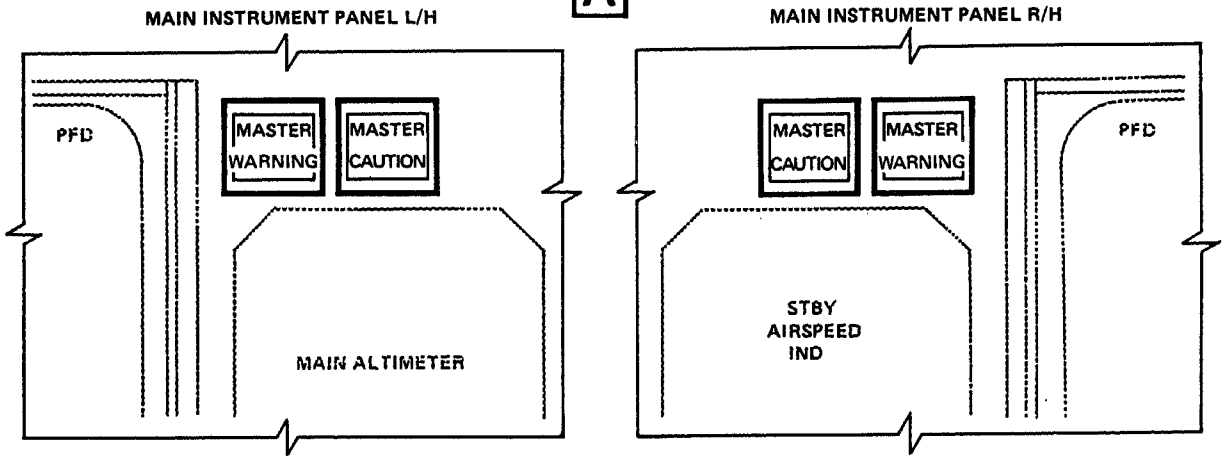
Control and Indication - Component Location
Figure 002

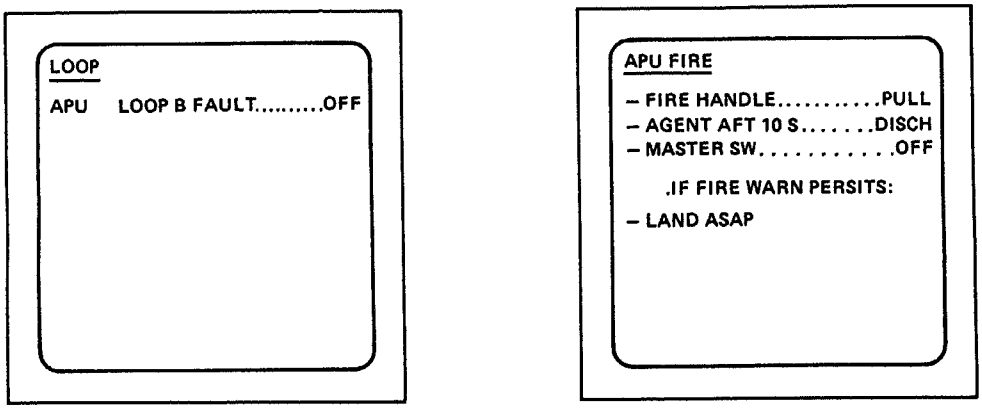



A




B

1WT ECAM WARNING DISPLAY UNIT

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ECAM Indication
Figure 003

3. Description
(Ref. Fig. 001)
(Ref. Fig. 004)

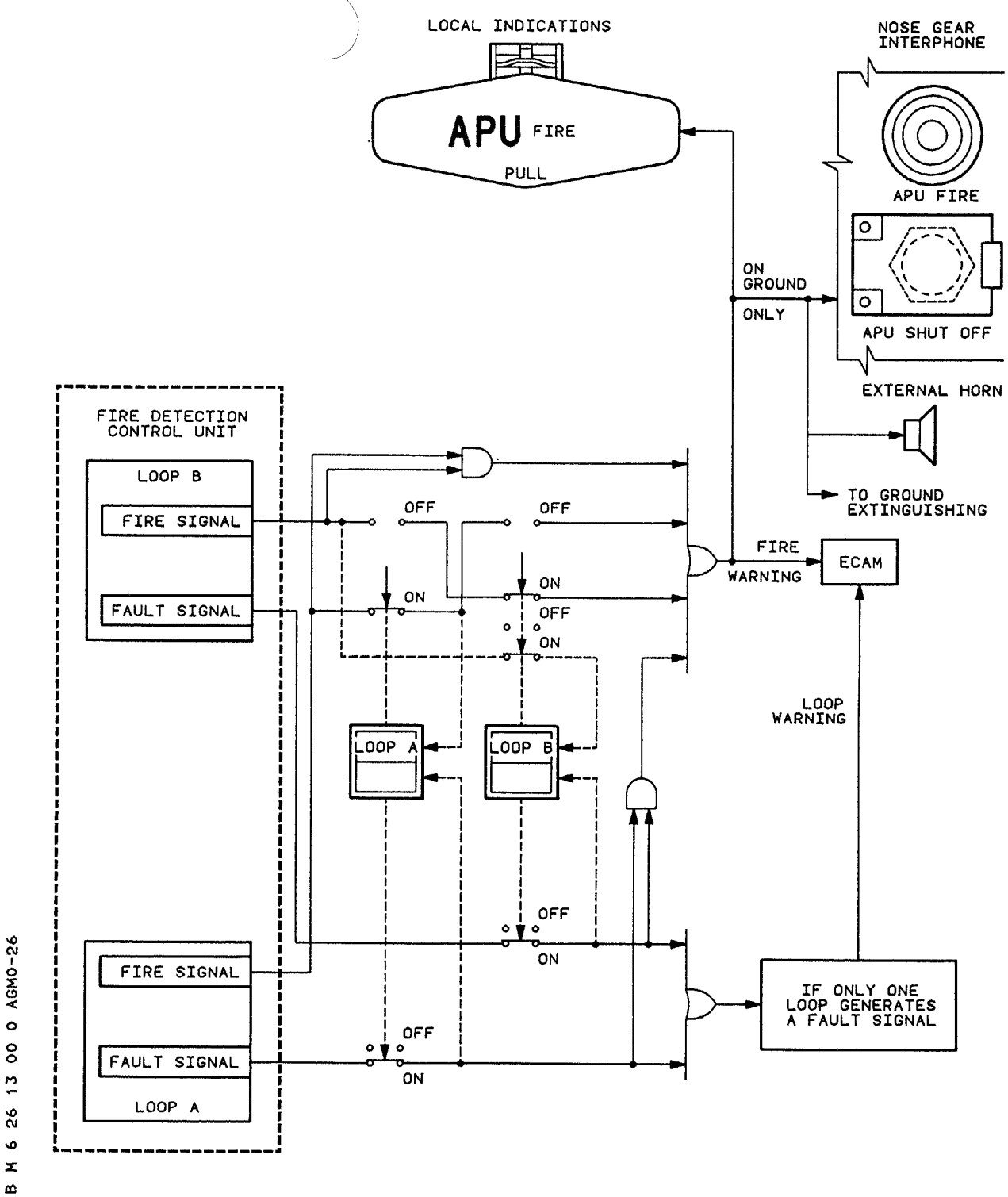
A. The APU fire detection system consists primarily of three main components:
- two identical sensing elements, mounted in parallel in the APU compartment, LOOP A and LOOP B.
- a fire detection control unit 13WG, located in the avionics compartment.
- a fire control module 20WG, located on the overhead control panel in the flight compartment.

B. The APU fire warning system generates two different warnings:
- the FIRE warning (red).
- the LOOP warning (amber).
The following table shows the conditions and the subsequent warnings.

**ON A/C ALL

R

| LOOP A (B) P/B Setting | Signal from Fire Detection Control Unit 13WG | Fault Indication |
|---|---|---|
| LOOP A and B pressed | 1)LOOP A Fire | LOOP A warning |
| | 2)LOOP B Fire | LOOP B warning |
| | 3)LOOP B or A Fault | LOOP warning |
| | 4)LOOP B and A Fault | LOOP A and B warning and Fire warning |
| | 5)LOOP A Fault<br>B Fire | LOOP A warning<br>LOOP B warning and Fire warning |
| | 6)LOOP A Fire<br>B Fault | LOOP A warning<br>LOOP B warning and Fire warning |
| LOOP A released<br>LOOP B pressed | 1)LOOP B Fault<br>2)LOOP B Fire | LOOP B warning<br>LOOP B warning Fire warning |
| LOOP A pressed<br>LOOP B released | 1)LOOP A Fault<br>2)LOOP A Fire | LOOP A warning<br>LOOP A warning Fire warning |




Fire and Loop Warning - Logic Schematic
Figure 004

**ON A/C ALL

4. Component Description

A. Sensing Elements 21WG, 22WG
(Ref. Fig. 005)
(Ref. Fig. 006)
The Detector/Responder Sensor is a pneumatic device consisting of a sensor tube and a responder. The sensor tube contains a hydrogen-charged core material with helium under pressure. The responder is attached to one end of the sensor tube and contains two independently operating pressure switches. One switch, called the INTEGRITY switch is normally held closed by helium pressure. Should the sensor tube lose pressure through damage or any other cause, the switch will open, initiating a FAULT output from the fire detection control unit. The other switch, called the ALARM switch, is normally open. When heat exceeds the preset limits, the switch will close, thereby causing the fire detection control unit to initiate a FIRE output.
The following temperatures in the APU compartment will initiate FIRE ALARM:
- Overall temperature of 190 ±12 °C (374 ±22 °F).
- Local temperature of 482 ±30 °C (900 ±54 °F).
When the overall temperature in the APU compartment has decreased to reset temperature, the amber warning lights, LOOP A and LOOP B, go off.

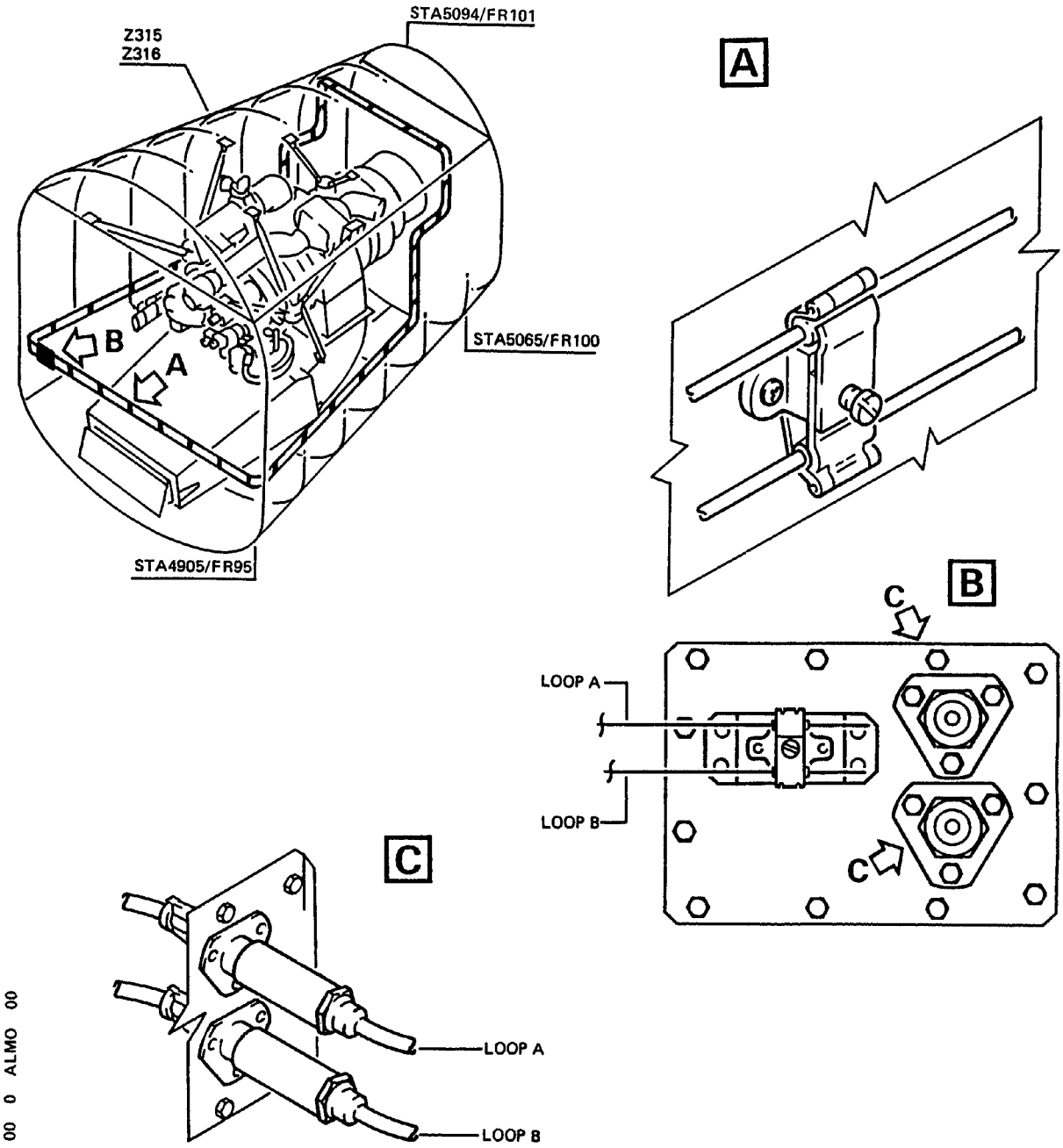
B. APU Fire Detection Control Unit 13WG
(Ref. Fig. 007)
The purpose of the fire detection control unit is to monitor the two temperature sensing elements and energize warning devices if an overheat or fire occurs in the APU comparment. The fire detection control unit also provides outputs to indicate fault conditions.
The control unit incorporates test facilities which enable to test the system from the flight compartment or from the control unit.
Two tests can be carried out:
- LOOP Test checks the loops and the control unit,
- BITE Test enables rapid fault diagnosis.
NOTE : The APU FIRE warning is also actived when both pushbutton switches (LOOP A and LOOP B) are selected OFF and the fire detection control unit generates a fire signal related to both LOOP A and LOOP B.

5. Operation

**ON A/C ALL

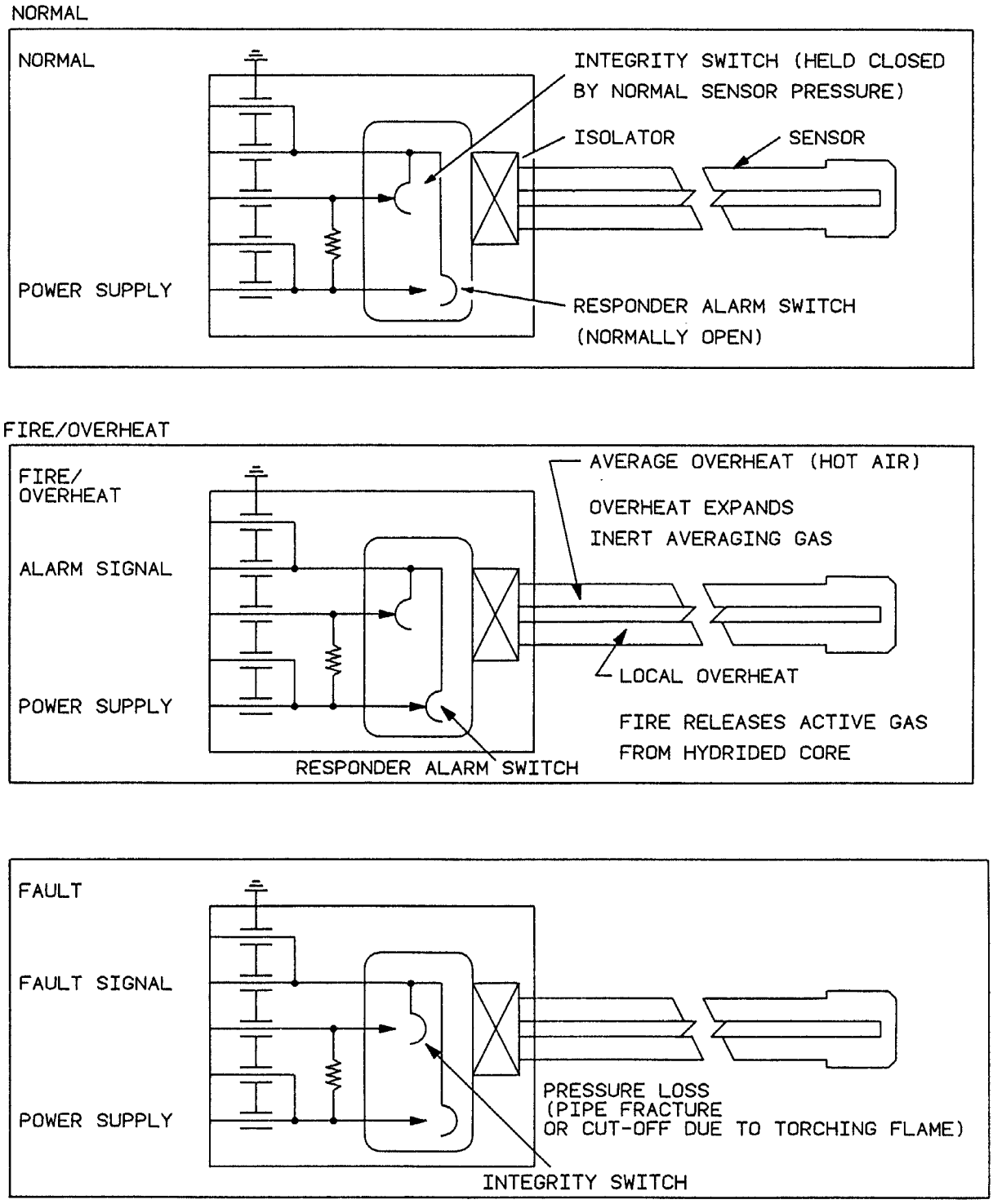
R

(Ref. Fig. 008)




BM6 26 13 00 0 ALMO 00

Sensing Elements and Responders
Figure 005

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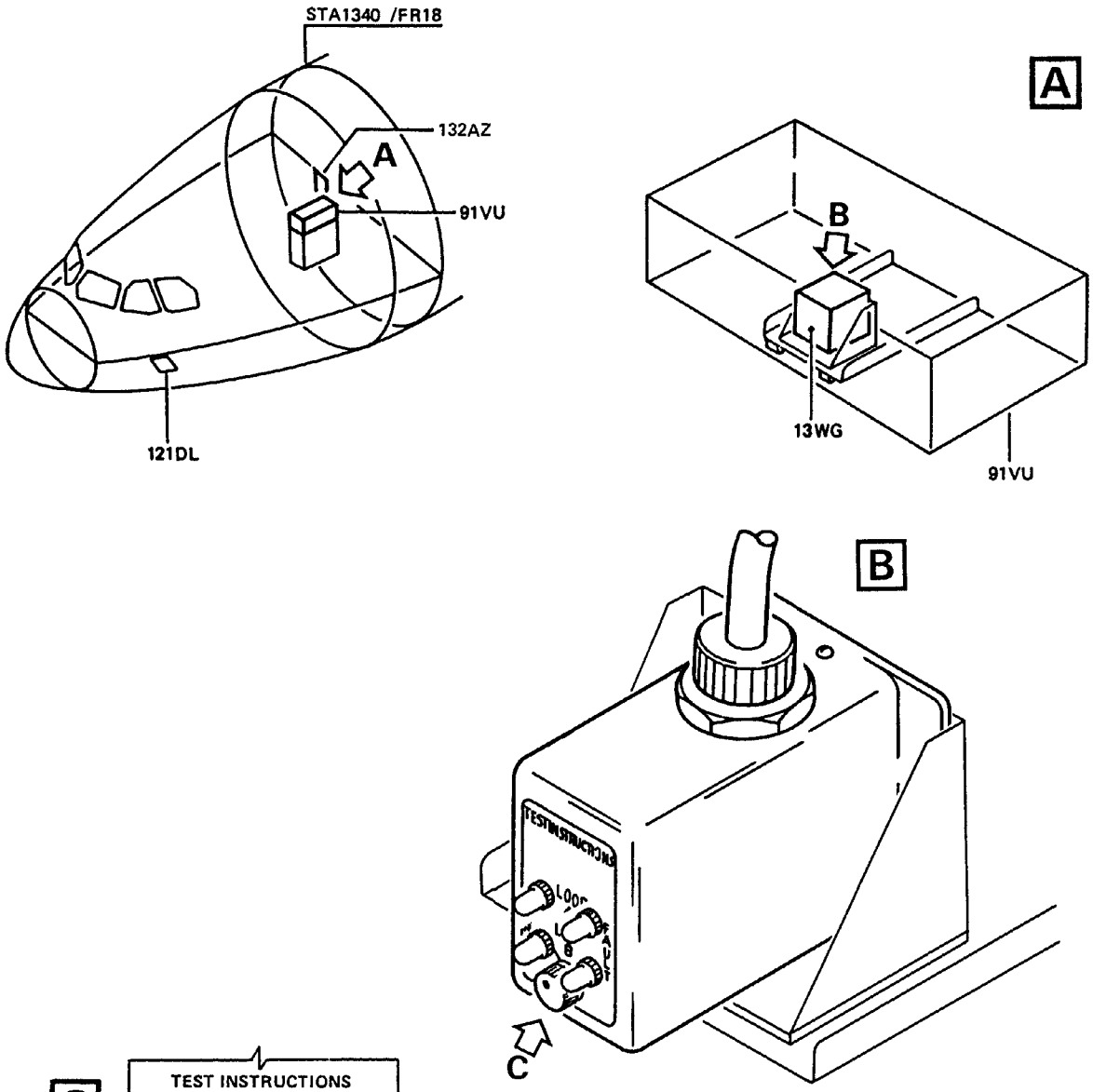
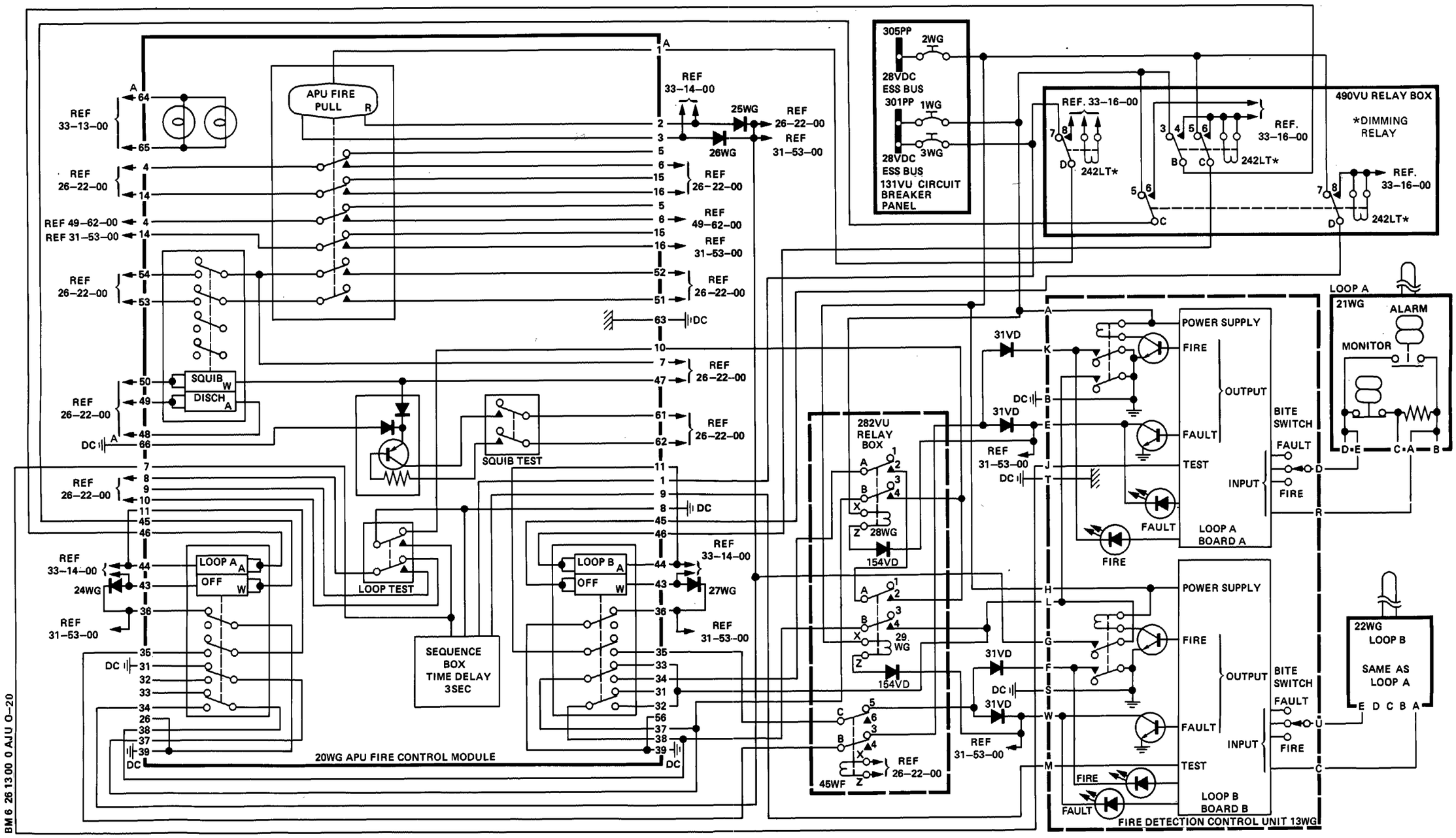
Detector/Responder
Figure 006




BM6 26 13 00 0 APMO 00

APU Fire Detection Control Unit
Figure 007




APU Fire and Overheat Detection - Function Diagram
Figure 008

**ON A/C ALL

(Ref. Fig. 009)

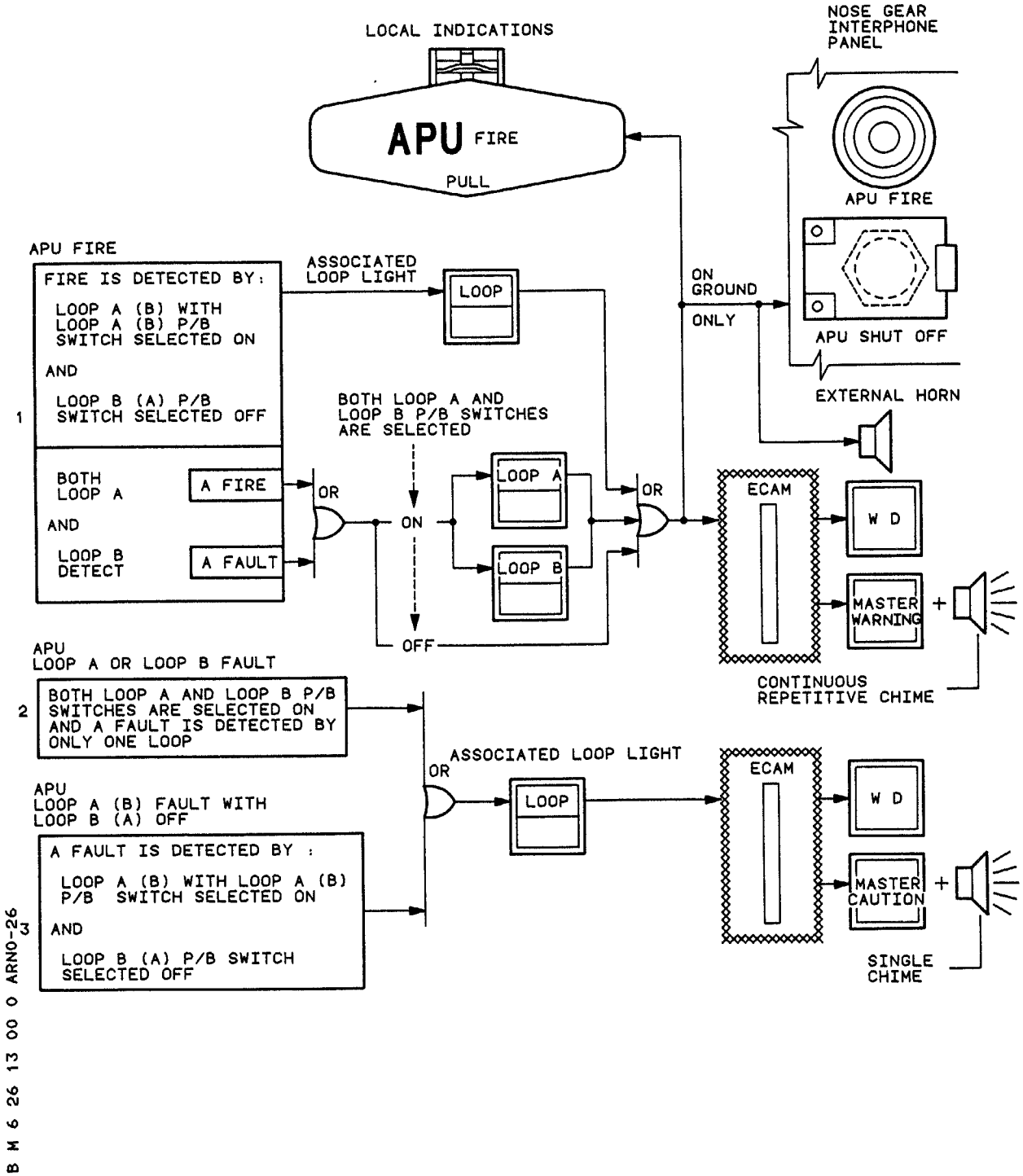
A. Fire Warning
As the overall temperature in the APU compartment increases, the internal pressure of the sensor is proportionally raised. This increase in gas pressure causes a pressure switch to close, initiating a FIRE alarm.
The following actions occur:
- LOOP A and LOOP B lights come on.
- on fire control module 20WG, APU FIRE PULL comes on.
- on main instrument panel, MASTER WARNING lights come on.
- Continuous repetitive chime sounds.
- on L ECAM display the following message appears:
APU FIRE
- FIRE HANDLE PULL
- AGENT AFT 10 SECS...DISCH
- MASTER SW...OFF
On ground only:
on Interphone Box 3WC
- APU FIRE comes on.
- External horn in nose gear bay sounds.
- Automatic fire extinguishing is initiated.

B. Loop Warning
When a detector suffers from any loss of pressure, the integrity switch (normally held closed by sensor pressure) opens. This causes the fire detection control unit to initiate a LOOP warning.
The following actions occur:
- on fire detection control module 20WG, LOOP A (B) comes on.

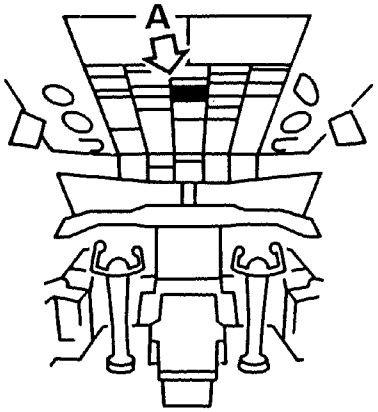
- on main instrument panel, MASTER CAUTION lights come on.
- single chime sounds.
- on L ECAM display the following message appears:
LOOP
APU LOOP A (B) FAULT ...OFF

6. Control and Indicating
(Ref. Fig. 010)

A. APU Fire Control Module 20WG
(1)LOOP A (B) pushbutton switch
On position (P/B switch pressed)
- The light comes on amber when a fire or fault signal is generated by the fire detection control unit.
- Aural and visual warnings are activated.
- The warnings go off when the APU FIRE handle is pulled.
- off position (P/B switch released).
- Aural and visual warnings are inhibited for the related LOOP.
- The OFF light is on white.

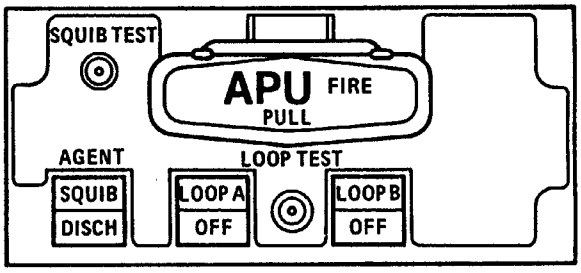



Fire and Loop Warning
Figure 009




A

APU FIRE CONTROL MODULE 20WG

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Fire Control Module
Figure 010

(2)LOOP TEST Pushbutton
The pushbutton controls the test of:
- both fire detection loops
- APU FIRE and LOOP local warnings with ECAM activation.

NOTE : Both pushbutton switches LOOP A and LOOP B must be selected ON, and the APU FIRE handle must be in Normal position for complete system test.

P/B pressed and held
LOOP and APU FIRE warnings are tested in sequence. A successful test results in the following indications:
- LOOP A light comes on
- ECAM is momentarily activated (MASTER CAUTION light comes on and goes off associated with single stroke chime)

After a few seconds:
- LOOP B light comes on
- LOOP A light remains on
- APU FIRE light integrated into the APU FIRE handle comes on
- ECAM is activated (MASTER WARNING light comes on and flashes associated with continuous repetitive chime)

P/B released
- Fire warnings are cancelled
- LOOP B light remains on
- ECAM is momentarily activated (MASTER CAUTION light comes on and goes off, associated with single stroke chime)

After a few seconds:
- LOOP B light goes off

NOTE : During LOOP TEST, the APU fire external warnings (APU FIRE light on the nose gear interphone panel and external horn) are inhibited.

## 7. TEST

### A. Loop Test

The purpose of the LOOP TEST is to check the serviceability of:
- both sensing loops for integrity
- fire detection control unit for correct operation

Operation of the test switch causes the following indications:
- APU FIRE handle light comes on
- LOOP A and LOOP B lights come on
- MASTER CAUTION light comes on
- MASTER WARNING light comes on
- ECAM display comes on
- Aural chime sounds

All warnings and aural sounds cancel on release of LOOP test switch.
If test is unsatisfactory, a BITE test is to be carried out.

### B. Built-in test equipment facility (BITE) (Ref. Fig. 007)

The fire detection control unit incorporates a rotary BITE switch and 4 BITE lamps (2 ALARM (red) and 2 FAULT (yellow)) for use during test.
The switch returns automatically to the center, off position.
This facility enables identification of a fault to either a control

unit or a sensor detector assembly.
**BITE** test operation:
Turning the rotary switch first to the **ALARM** position and then to the **FAULT** position gives the following indications:
Both sets of bite lamps (**LOOP A** and **LOOP B**) come on after selection, showing control circuit integrity.
When after observation of the Detector Control unit any of the four lamps are on, by turning the rotary switch towards the indicated lamp(s) the following should occur.
- Lamp(s) go off - Detector fault.
- Lamp(s) remain on - Controller fault.

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS, UPON WHICH WORK IS IN PROGRESS, ARE ISOLATED.

WARNING : DO NOT DISCONNECT CONNECTORS WITHOUT CIRCUIT BREAKERS 1WF AND 2WF BEING OPENED AND SAFETIED.

NOTE : If the test is performed while APU is running the test would result in an APU auto shutdown.

## 1. Operational Test of APU Fire and Overheat Detection System

A. Reason for the Job

(1)Loop test with LOOP A and LOOP B and checking of displays (extended loop test).

(2)LOOP test with LOOP A or LOOP B (extended loop test).

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200V, 400Hz |
| Referenced Procedure | |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 31-51-00, P. Block 201 | ECAM SYSTEM |

C. Procedure

(1)Job Set-Up

(a)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Make certain that electronics racks ventilation is correct.

(c)Open, safety and tag the following circuit breakers

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | APU/FIRE EXTING/SQUIB A | 1WF | 403/B61 |
| 131VU | APU/FIRE EXTING/SQUIB B | 2WF | 403/A61 |

(d)Make certain that the following circuit breakers are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 132VU | LIGHTING/MAINT PANEL/ANN & MFA | 1WB | 324/L78 |
| 132VU | LIGHTING/MAINT PANEL/ANN & MFA | 22WB | 324/L79 |
| 131VU | APU/FIRE DET/LOOP B | 2WG | 318/A59 |
| 131VU | APU/FIRE DET/FIRE WARN | 3WG | 317/B58 |
| 131VU | APU/FIRE DET/LOOP A | 1WG | 317/B59 |

(e)Start ECAM SYSTEM (Ref. 31-51-00, P. Block 201).

**After ECE SB 26-203

(2)Test with LOOP A and LOOP B
(a)Make certain that APU-FIRE/PULL handle is in pushed position, and pushbutton switches LOOP A and LOOP B are pressed.

| ACTION | RESULT |
|---|---|
| 1. On APU fire control module 20WG: | On APU fire control module 20WG: |
| - Press and hold LOOP TEST pushbutton switch. | - Amber light LOOP A comes on. |
| | On main instrument panels 3VU and 5VU: |
| | - MASTER/CAUTION lights come on and then go off. |
| | In flight compartment: |
| | - Single stroke chime sounds. |
| | On L ECAM display unit: |
| | - LOOP A FAULT message appears. |
| After 3.5 seconds delay: | On APU fire control module 20WG: |
| | - Amber light LOOP B and APU-FIRE/PULL handle warning light come on. |
| | On main instrument panels 3VU and 5VU: |
| | - MASTER/WARNING lights flash. |
| | In flight compartment: |
| | - Repetitive chime sounds. |
| | On L ECAM display unit: |
| | - LOOP A FAULT message disappears. |
| | - APU FIRE message appears. |
| - Release LOOP TEST pushbutton switch. | On APU fire control module 20WG: |
| | - APU-FIRE/PULL handle light goes off. |
| | - Amber light LOOP A goes off. |
| | In flight compartment: |
| | - Repetitive chime stops. |
| | On main instrument panels 3VU and 5VU: |
| | - MASTER/WARNING lights go off. |
| | On L ECAM display unit: |
| | - APU FIRE message disappears. |
| | - LOOP B FAULT message appears. |
| After 3.5 seconds delay: | On APU fire control module 20WG: |
| | - Amber light LOOP B goes off. |
| | On main instrument panels 3VU and 5VU: |
| | - MASTER/CAUTION lights come on and then go off. |
| | In flight compartment: |
| | - Single stroke chime sounds. |
| | On L ECAM display unit: |
| | - LOOP B FAULT message disappears. |

R **ON A/C 001-104,

(3)Test with LOOP A or LOOP B
(a)Make certain that APU-FIRE/PULL handle is in pushed position.

| ACTION | RESULT |
|---|---|
| 1. On APU fire control module 20WG:<br>- Release LOOP A (LOOP B) pushbutton switch. | On APU fire control module 20WG:<br>- White OFF legend on LOOP A (LOOP B) comes on.<br>On main instrument panels 3VU and 5VU:<br>- MASTER/CAUTION lights come on.<br>In flight compartment:<br>- Single stroke chime sounds.<br>On L ECAM display unit: |
| - LOOP A (LOOP B) OFF message appears. | |
| 2. On panel 131VU:<br>- Open circuit breaker 1WG (2WG). | Indications described under para. 1. remain on. |
| 3. On APU fire control module 20WG:<br>- Press and hold LOOP TEST pushbutton switch | NOTE : Test without LOOP A.<br>After 3.5 seconds time delay, on APU fire control module 20WG:<br>- Amber light LOOP B and APU-FIRE/PULL handle warning light come on.<br>NOTE : Test without LOOP B.<br>On APU fire control module 20WG:<br>- Amber light LOOP A and APU-FIRE/PULL handle warning light come on.<br>NOTE : Test without LOOP A or LOOP B.<br>On main instrument panels 3VU and 5VU:<br>- MASTER/WARNING lights flash.<br>- MASTER/CAUTION lights go off.<br>In flight compartment:<br>- Repetitive chime sounds.<br>On L ECAM display unit:<br>- LOOP A (LOOP B) OFF message disappears.<br>- APU FIRE message appears. |
| - Release LOOP TEST pushbutton switch. | NOTE : Test without LOOP A.<br>After 3.5 seconds time delay on APU fire control module 20WG:<br>- Amber light LOOP B and APU-FIRE/PULL handle warning light go off. |

| ACTION | RESULT |
|---|---|
| | NOTE : Test without LOOP B.<br>On APU fire control module 20WG:<br>- Amber light LOOP A and APU-FIRE/ PULL handle warning light go off.<br>NOTE : Test without LOOP A or LOOP B.<br>In flight compartment:<br>- Repetitive chime stops.<br>On main instrument panels 3VU and 5VU:<br>- MASTER/WARNING lights go off.<br>- MASTER/CAUTION lights come on.<br>In flight compartment:<br>- Single stroke chime sounds.<br>On L ECAM display unit:<br>- APU FIRE message disappears.<br>- LOOP A (LOOP B) OFF message appears. |

R **ON A/C 105-200,

(3)Test with LOOP A or LOOP B
(a)Make certain that APU-FIRE/PULL handle is in pushed position.

| ACTION | RESULT |
|---|---|
| 1. On APU fire control module 20WG:<br>- Release LOOP A (LOOP B) pushbutton switch. | On APU fire control module 20WG:<br>- White OFF legend on LOOP A (LOOP B) comes on.<br>On main instrument panels 3VU and 5VU:<br>- MASTER/CAUTION lights come on.<br>In flight compartment:<br>- Single stroke chime sounds.<br>On L ECAM display unit:<br>- LOOP A (LOOP B) OFF message appears. |
| 2. On panel 131VU:<br>- Open circuit breaker 1WG (2WG). | Indications described under para. 1. remain on. |

| ACTION | RESULT |
|---|---|
| | NOTE : Test without LOOP A. |
| 3. On APU fire control module 20WG:<br>- Press and hold LOOP TEST pushbutton switch | After 4.5 seconds time delay, on APU fire control module 20WG:<br>- Amber light LOOP B and APU-FIRE/PULL handle warning light come on. |
| | NOTE : Test without LOOP B. |
| | On APU fire control module 20WG:<br>- Amber light LOOP A and APU-FIRE/PULL handle warning light come on |
| | NOTE : Test without LOOP A or LOOP B. |
| | On main instrument panels 3VU and 5VU:<br>- MASTER/WARNING lights flash.<br>- MASTER/CAUTION lights go off.<br>In flight compartment:<br>- Repetitive chimesounds.<br>On L ECAM display unit:<br>- LOOP A (LOOP B) OFF message disappears.<br>- APU FIRE message appears. |
| Release LOOP TEST pushbutton switch. | NOTE : Test without LOOP A.<br>After 4.5 seconds time delay on APU fire control module 20WG:<br>- Amber light LOOP B and APU-FIRE/PULL handle warning light gooff. |
| | NOTE : Test without LOOP B. |
| | On APU fire control module 20WG:<br>- Amber light LOOP A and APU-FIRE/PULL handle warning light go off. |
| | NOTE : Test without LOOP A or LOOP B. |
| | In flight compartment:<br>- Repetitive chime stops.<br>On main instrument panels 3VU and 5VU:<br>- MASTER/WARNING lights go off.<br>- MASTER/CAUTION lights come on.<br>In flight compartment:<br>- Single stroke chime sounds. |

| ACTION | RESULT |
|---|---|
| | On L ECAM display unit:<br>- APU FIRE message disappears.<br>- LOOP A (LOOP B) OFF message appears. |

R **ON A/C ALL

(4)Close-Up
(a)De-energize aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).
(b)Remove safety clips and tags and close circuit breakers 1WF and 2WF.
(c)Make certain that circuit breaker 1WG (2WG) is closed.
(d)Make certain that LOOP A and LOOP B pushbuttons are pressed (in).

2. Operational Test of Fire Control Unit

A. Reason for the Job
(1)Built-in Test Equipment (BITE) test of fire control unit.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200V, 400Hz |

Referenced Procedure

| | |
|---|---|
| - 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure
(1)Job Set-Up
(a)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that electronics racks ventilation is correct.
(c)Open safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | APU/FIRE EXTING/SQUIB A | 1WF | B61 |
| 131VU | APU/FIRE EXTING/SQUIB B | 2WF | A61 |
| 131VU | APU/FIRE EXTING/AUTO EXTING GND TEST | 30WF | B60 |

(d)Make certain that the following circuit breakers are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | APU/FIRE DET/LOOP A | 1WG | B59 |
| 131VU | APU/FIRE DET/LOOP B | 2WG | A59 |
| 131VU | APU/FIRE DET/FIRE WARN | 3WG | B58 |

(2)Test

| ACTION | RESULT |
|---|---|
| 1. On avionics compartment shelf 91VU, on fire detection control unit 13WG: | |
| - Place and hold selector switch in ALARM position. | On fire detection control unit 13WG:<br>- Two red light emitting diodes ALARM come on.<br>In flight compartment, on APU fire control module 20WG:<br>- Amber light LOOP A, LOOP B and APU-FIRE/PULL handle warning light come on.<br>- Repetitive chime sounds.<br>On main instrument panels 3VU and 5VU:<br>- MASTER/WARNING lights flash.<br>On L ECAM display unit:<br>- APU FIRE message appears. |
| - Release selector switch. | All indications mentioned above go off. |
| 2. On fire detection control unit 13WG: | On fire detection control unit 13WG: |
| - Place and hold selector switch in FAULT position. | - Two yellow light emitting diodes FAULT comes on.<br>In flight compartment, on APU fire control module 20WG:<br>- Amber light LOOP A, LOOP B and APU FIRE PULL handle warning light come on.<br>- Repetitive chime sounds.<br>On main instrument panels 3VU and 5VU:<br>- MASTER/WARNING lights flash.<br>On L ECAM display unit:<br>- APU FIRE appears. |
| - Release selector switch. | All indications mentioned above go off. |

(3)Close-Up

(a)De-energize aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).

(b)Remove safety clips and tags and close circuit breakers 1WF, 2WF and 30WF.

3. Functional Test of Sensing Elements Continuity and Electrical Resistance

A. Reason for the Job

(1)To check that after removal/installation of a component, APU fire detection system operates correctly

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Multimeter |
| (2) | Megohmmeter |
| (3) | Access Platform, 6 m (20 ft.) |

C. Procedure

(1)Job Set-Up

(a)Position access platform.

(b)Open access doors 313AL, 315AL and 316AR.

(c)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | APU/START | 50KA | B54 |
| 131VU | APU/FIRE DET/LOOP A | 1WG | B59 |
| 131VU | APU/FIRE DET/LOOP B | 2WG | A59 |
| 131VU | APU/FIRE DET/FIRE WARN | 3WG | B58 |
| 131VU | APU/FIRE EXTING/SQUIB A | 1WF | B61 |
| 131VU | APU/FIRE EXTING/SQUIB B | 2WF | A61 |

(2)Test

| ACTION | RESULT |
|---|---|
| 1. Using multimeter, measure resistance between aircraft structure ground and outer sheath of loop A in APU compartment. | Resistance shall be less than one ohm. |
| 2. Using multimeter, measure resistance between aircraft structure ground and outer sheath of loop B in APU compartment. | Resistance shall be less than one ohm. |
| WARNING : DO NOT DISCONNECT CONNECTORS WITHOUT CIRCUIT BREAKERS 1WF AND 2WF BEING OPENED AND SAFETIED. | |
| 3. In avionics compartment, disconnect electrical connector from fire control unit 13WG. Using multimeter, measure resistance of center conductor pins D to R, sensing elements' continuity. | Resistance shall be between 1.4 and 1.6 Kohm. |
| 4. Repeat step 3. using pins C to U. | Resistance shall be between 1.4 and 1.6 Kohm. |
| 5. Using megohmmeter, set to 100V DC max. output, measure resistance of center conductor, pins D to B, sensing elements' insulation resistance. | Resistance shall be at least 10 megohm. |
| 6. Repeat step 5. using pins C to B. | Resistance shall be at least 10 megohm. |
| 7. If steps 5. and 6. produce measured values of 10 megohm or more, reconnect electrical connector to fire control unit 13WG, carry out operational test, refer to para. 1, and job Close-Up (3). If steps 5. and/or 6. produce measured values less than 10 megohm, carry out steps 8. to 10. | |

| ACTION | RESULT |
|---|---|
| 8. At front fire wall disconnect connector from sensing element which failed insulation resistance test, loop A element 21WG, loop B element 22WG. Using megohmmeter set to 100V DC max. output, measure resistance of each sensing element. Measure resistance of pin E to ground. Measure resistance on connector 21WG or 22WG between pin E to ground and pin A to ground. | Resistance shall be at least 10 megohm. |
| 9. Reconnect connector to sensing element, repeat step 3. for loop A and/or 4. for loop B. | Resistance shall be between 1.4 and 1.6 kohm. |
| 10. Carry out operational test, refer to para. 1. | |

(3) Close-Up
  (a) Remove safety clips and tags and close circuit breakers 50KA, 1WG, 2WG, 3WG, 1WF and 2WF.
  (b) Make certain that working areas are clean and clear of tools and miscellaneous items of equipment.
  (c) Close access doors 313AL, 315AL and 316AR.
  (d) Remove access platform.

## APU FIRE AND OVERHEAT DETECTION CONTROL UNIT REMOVAL/INSTALLATION

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS, UPON WHICH WORK IS IN PROGRESS, ARE ISOLATED.
WARNING : DO NOT DISCONNECT CONNECTORS WITHOUT CIRCUIT BREAKERS 1WF AND 2WF BEING OPENED AND SAFETIED.

### 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 2.7 m (9 ft.) |
| B. | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| C. | Blanking Caps |
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

### 2. Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | APU/FIRE DET/LOOP B | 2WG | 109/A59 |
| 131VU | APU/FIRE EXTING/SQUIB B | 2WF | 109/A61 |
| 131VU | APU/ECB SUPPLY BACK UP | 58KD | 108/B52 |
| 131VU | APU/START | 50KA | 108/B54 |
| 131VU | APU/ECB SUPPLY/MAIN | 1KD | 108/B57 |
| 131VU | APU/FIRE DET/FIRE WARN | 3WG | 108/B58 |
| 131VU | APU/FIRE DET/LOOP A | 1WG | 108/B59 |
| 131VU | APU/FIRE EXTING/SQUIB A | 1WF | 108/B61 |

(2)Position access platform at zone 134.
(3)Open FWD cargo compartment door 811.
(4)Open avionics compartment door 132AZ.

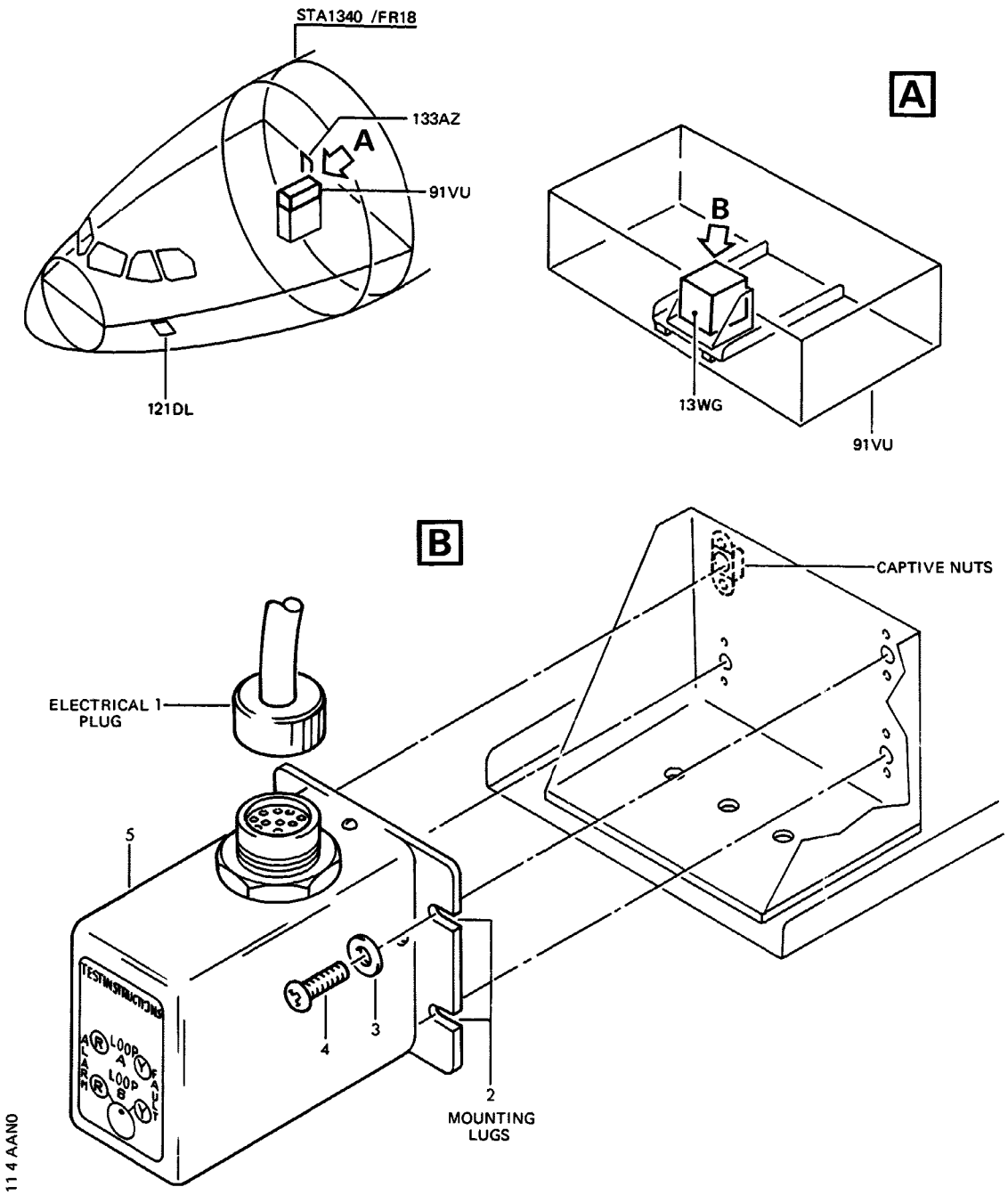
B. Removal
WARNING : DO NOT DISCONNECT CONNECTORS WITHOUT CIRCUIT BREAKERS 1WF AND 2WF BEING OPENED AND SAFETIED.
(1)Disconnect cable-mounted connector (1) from control unit connector and cap both items.
(2)Remove and retain screws (4) and washers (3) securing control unit (5) to support fitting.
(3)Remove control unit (5) from support fitting.

C. Installation
(1)Position control unit (5) in support fitting and align the unit mounting lugs with the captive nuts on the support fitting.

(2)Secure control unit (5) in position using screws (4) and washers (3).
(3)Remove protective caps from unit connector and cable-mounted connector.
(4)Connect and secure cable-mounted connector (1) to unit connector.
(Ref. Fig. 401)

D. Test
(1)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)Make certain that circuit breakers 1WG, 2WG, 3WG are closed.

| ACTION | RESULT |
|---|---|
| 1. On avionics compartment shelf 91VU, on fire detection control unit 13WG:<br>- Place and hold selector switch in ALARM position. | On fire detection control unit 13WG:<br>- Two red light emitting diodes ALARM come on.<br><br>In flight compartment, on APU fire control module 20WG:<br>- Amber light LOOP A, LOOP B and APU-FIRE/PULL handle warning light come on.<br>In flight compartment:<br>- Repetitive chime sounds.<br>On main instrument panels 3VU and 5VU:<br>- MASTER/WARNING lights flash.<br>On L ECAM display unit:<br>- APU FIRE appears. |
| - Release selector switch. | All indications mentioned above go off. |
| 2. On fire detection control unit 13WG:<br>- Place and hold selector switch in FAULT position. | On fire detection control unit 13WG:<br>- Two yellow light emitting diodes FAULT come on.<br>In flight compartment:<br>- Repetitive chime sounds.<br>In flight compartment, on APU fire control module 20WG:<br>- Amber light LOOP A, LOOP B and APU-FIRE/PULL handle warning light come on.<br>On main instrument panels 3VU and 5VU:<br>- MASTER/WARNING lights flash.<br>On L ECAM display unit:<br>- APU FIRE appears. |
| - Release selector switch. | All indications mentioned above go off. |




APU Fire and Overheat Detection Control Unit
Figure 401

E. Close-Up

(1) De-energize aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).
(2) Remove safety clips and tags and close circuit breakers 1WF, 2WF, 1KD, 50KA and 58KD.
(3) Make certain that the working area is clean and clear of tools and miscellaneous items of equipment.
(4) Close access door 132AZ.
(5) Close FWD cargo compartment door 811.
(6) Remove access platform.

WARNING : DO NOT DISCONNECT ELECTRICAL CONNECTOR WITHOUT CIRCUIT BREAKERS 1WF AND 2WF PULLED AND SECURED.
CAUTION : MOISTURE-REMOVING OIL (MAT. NO. 05-027) MUST NOT BE BROUGHT INTO CONTACT WITH SENSING ELEMENT CONNECTIONS.

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 6 m (20 ft.) |
| B. Material No. 05-027 | Special Materials (Ref. 20-31-00) |
| C. | Multimeter |
| D. | Megohmmeter |
| E. | Blanking Caps |
| F. | Circuit Breaker Safety Clips |
| G. | O-Rings |

Referenced Procedure

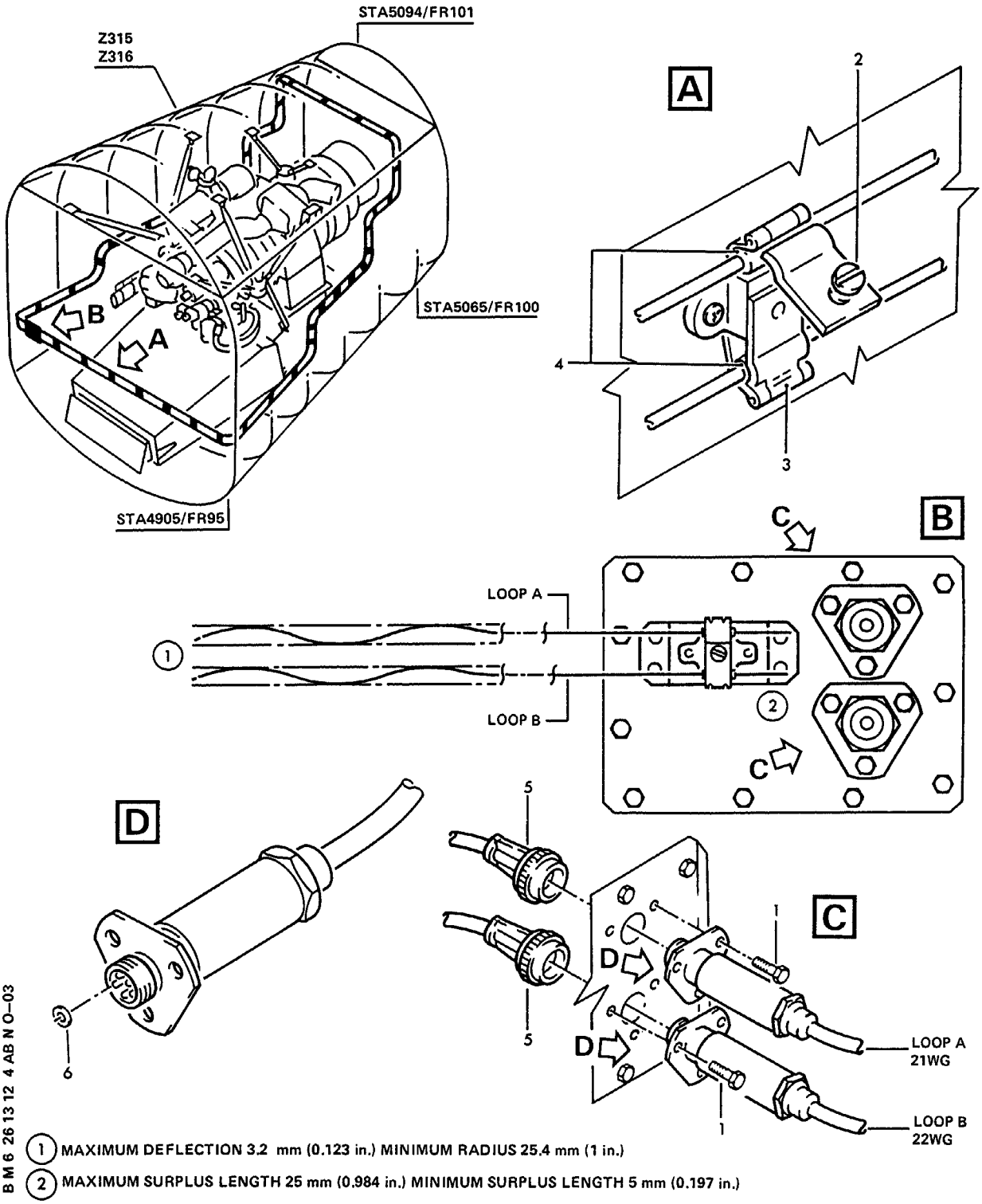
| | |
|---|---|
| - 51-75-10, P. Block 801 | Repair of Paint Coatings |

2. Procedure
(Ref. Fig. 401)

A. Job Set-Up
(1)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | APU/ECB SUPPLY/MAIN | 1KD | B57 |
| 131VU | APU/FIRE DET/LOOP A | 1WG | B59 |
| 131VU | APU/FIRE DET/LOOP B | 2WG | A59 |
| 131VU | APU/FIRE DET/FIRE WARN | 3WG | B58 |
| 131VU | APU/START | 50KA | B54 |
| 131VU | APU/ECB SUPPLY/BACKUP | 58KD | B52 |
| 131VU | APU/FIRE EXTING/SQUIB/A | 1WF | B61 |
| 131VU | APU/FIRE EXTING/SQUIB/B | 2WF | A61 |

(2)Position access platform and open APU doors 313AL, 315AL and 316AR.




(1) MAXIMUM DEFLECTION 3.2 mm (0.123 in.) MINIMUM RADIUS 25.4 mm (1 in.)

(2) MAXIMUM SURPLUS LENGTH 25 mm (0.984 in.) MINIMUM SURPLUS LENGTH 5 mm (0.197 in.)

APU Fire Sensing Element
Figure 401

B. Removal

WARNING : DO NOT DISCONNECT WITHOUT CIRCUIT BREAKERS 1WF AND 2WF PULLED AND SECURED.

(1)Disconnect electrical connectors (5) and fit blanking caps.
(2)Support sensing elements.
(3)Remove screws (2) and open dual clamps (3).
(4)Remove screws (1) and remove sensing elements 21WG and 22WG.
(5)Remove and discard o-rings (6) from pins in each connector housing.

C. Preparation of Replacement Components

(1)Install support bushes (4) retained from removed component on replacement component.

D. Installation

(1)Remove blanking caps and position sensing elements.
NOTE : Position longer sensing element to lower clamp half.
(2)Install new o-rings (6) on pins in each connector housing.
(3)Install screws (1).
(4)Position support bushes (4) to dual clamps (3) and install screws (2).
NOTE : Support bushes are installed with slit upwards when horizontal, and rearwards when vertical.
CAUTION : MOISTURE-REMOVING OIL (MAT. NO. 05-027) MUST NOT BE BROUGHT INTO CONTACT WITH SENSING ELEMENT CONNECTIONS.
(5)Apply moisture-removing oil (Mat. No. 05-027) to clamps (6) and screws (2) (Ref. 51-75-10, P. Block 801).
(6)Connect electrical connectors (5).

E. Test

(1)Continuity and Electrical Resistance Test
(a)Make certain that circuit breakers 1KD, 1WG, 2WG, 3WG, 50KA, 58KD, 1WF and 2WF are open.
(2)Test

| ACTION | RESULT |
|---|---|
| 1. Using multimeter, measure resistance between aircraft structure ground and outer sheath of loop A in APU compartment. | Resistance shall be less than one ohm. |
| 2. Using multimeter, measure resistance between aircraft structure ground and outer sheath of loop B in APU compartment. | Resistance shall be less than one ohm. |

| ACTION | RESULT |
|---|---|
| WARNING : DO NOT DISCONNECT WITHOUT CIRCUIT BREAKERS 1WF AND 2WF PULLED AND SAFETIED. | |
| 3. In avionics compartment, disconnect electrical connector from dual control unit 13WG. Using multimeter, measure resistance of center conductor pins D to R, sensing elements continuity. | Resistance shall be between 1.4 and 1.6 kilohms. |
| 4. Repeat 3. using pins C to U. | Resistance shall be between 1.4 and 1.6 kilohms. |
| 5. Using megohmmeter, set to 100 V DC max. output, measure resistance of center conductor pins D to B, sensing elements insulation resistance. | Resistance shall be at least 10 megohms. |
| 6. Repeat 5. using pins C to B. | Resistance shall be at least 10 megohms. |
| 7. If steps 5. and 6. produced measured values of 10 megohms or more, reconnect electrical connector to control unit 13WG, carry on with job close-up (3). If steps 5. and/or 6. produce measured values less than 10 megohms carry out steps 8. to 9. | |
| 8. At forward fire wall disconnect connector from sensing element which failed insulation resistance test, loop A element 21WG, loop B element 22WG. Using megohmmeter set to 100 V DC max. output, measure resistance of each sensing element. Measure resistance on connector 21WG or 22WG between pin E to ground and A to ground. | Resistance shall be at least 10 megohms. |
| 9. Reconnect connector to sensing element, repeat step 3. for loop A and/or 4. for loop B. | Resistance shall be between 1.4 and 1.6 kilohms. |

(3)Close-Up
(a)Remove safety clips and tags and close circuit breakers 1KD, 58KD,

50KA, 1WG, 2WG, 3WG, 1WF and 2WF.

(b)Make certain that working areas are clean and clear of tools and miscellaneous items of equipment.

(c)Close access doors 313AL, 315AL and 316AR.

(d)Remove access platform.

R APU FIRE CONTROL MODULE - REMOVAL/INSTALLLATION
R

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Blanking Caps |
| B. | Circuit Breaker Safety Clips. |
| Referenced Procedures | |
| - 21-23-00, P. Block 301 | Electronics Racks Air Extraction |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 26-13-00, P. Block 501 | APU FIRE Control Module |
| - 26-22-00, P. Block 501 | APU FIRE Extinguishing |

2. Procedure

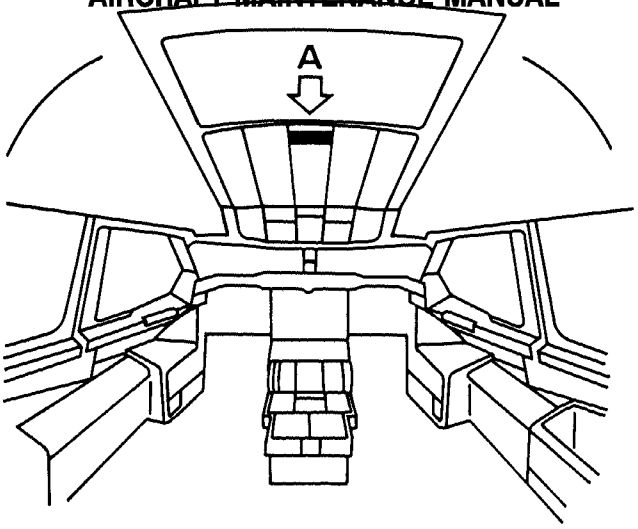
A. Job Set-Up
(1)Open, safety and tag the following circuit breakers :

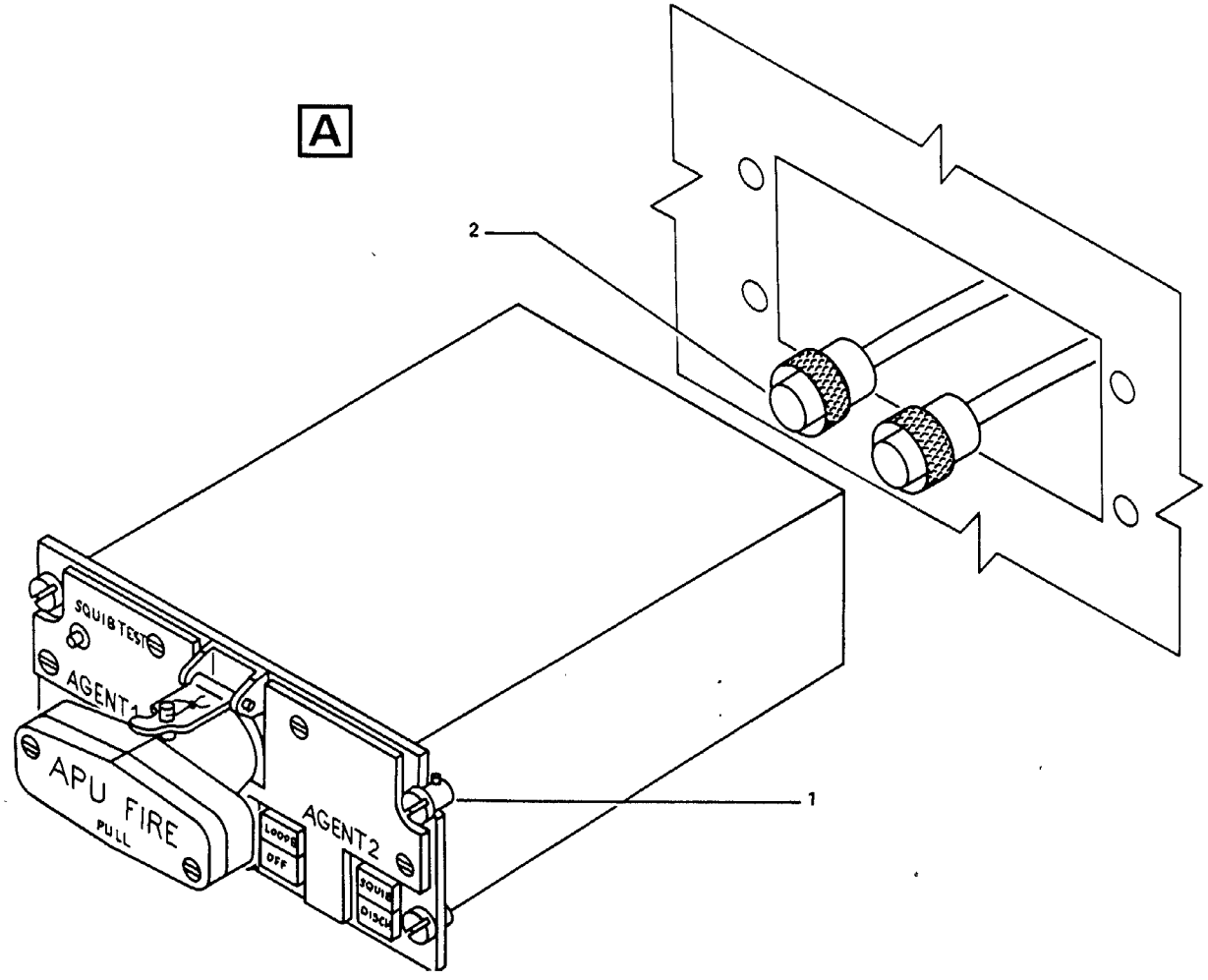
| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | APU/FIRE EXTING/SQUIB A | 1WF | 317/B61 |
| 131VU | APU/FIRE EXTING/SQUIB B | 2WF | 318/A61 |
| 131VU | APU/FUEL ISOL VALVE/CTL | 3WF | 317/B62 |
| 131VU | APU/FUEL LP VALVE/CTL | 4WF | 318/A62 |
| 131VU | APU/FIRE EXTING/AUTO EXTING GND TEST | 30WF | 317/B60 |
| 131VU | APU/FIRE DET/LOOP A | 1WG | 317/B59 |
| 131VU | APU/FIRE DET/LOOP B | 2WG | 318/A59 |
| 131VU | APU/FIRE DET/FIRE WARN | 3WG | 317/B58 |

B. Removal
(Ref. Fig. 401)
(1)Rotate QAD fasteners (1) one quarter of a turn, while holding module.
(2)Remove module from its housing.
(3)Disconnect plugs (2) from module connector.
(4)Install blanking caps on plugs and connectors.

C. Installation
(1)Uncap plugs (2) and connectors.
(2)Connect plugs (2) to connectors of module.
(3)Install module in its housing.
(4)Hold module and rotate QAD fasteners (1) one quarter of a turn.

D. Test
(1)Disconnect plug 11WF.B from fire extinguisher bottle in APU area.
(2)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301). Make certain that the electronics racks ventilation (Ref 21-23-00, P. Block 301) is correct.
(3)On APU FIRE control module
- Check that APU FIRE handle is pushed (in).

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APU FIRE Control Module 20WG
Figure 401

On FUEL section of panel 430VU.
- flowbar on LP VALVES/APU annonciator comes on.

(4)Make certain that the following circuit breakers are closed :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | APU/FIRE EXTING/SQUIB A | 1WF | 317/B61 |
| 131VU | APU/FIRE EXTING/SQUIB B | 2WF | 318/A61 |
| 131VU | APU/FUEL ISOL VALVE/CTL | 3WF | 317/B62 |
| 131VU | APU/FUEL LP VALVE/CTL | 4WF | 318/A62 |
| 131VU | APU/FIRE EXTING/SQUIB TEST | 7WF | 318/A60 |
| 131VU | APU/FIRE DET/LOOP A | 1WG | 317/B59 |
| 131VU | APU/FIRE DET/LOOP B | 2WG | 318/A59 |
| 131VU | APU/FIRE DET/FIRE WARN | 3WG | 317/B58 |
| 131VU | APU/FUEL LP VALVE/SUPPLY | 2QF | 318/A63 |
| 131VU | APU/FUEL ISOL VALVE/SUPPLY | 1QF | 317/B63 |

(5)Make certain that circuit breaker 30WF is open.

| ACTION | RESULT |
|---|---|
| On panel 472VU<br>CAUTION : NOTE ALL THE MFAs WHICH COME ON<br>- place ANN LT switch in READ position | On APU section of panel 472VU<br>- SHUD legend of APU/ISOL VALVE annunciators comes on. |
| On APU section of panel 429VU.<br>- place APU MASTER SWITCH in ON position | On APU section of panel 472VU<br>- SHUT legend of APU/ISOL VALVE annunciator goes off.<br>- OPEN legend OF APU/ISOL VALVE annunciator comes on. |
| On overhead panel APU FIRE<br>Control module 20WG<br>- press and hold LOOP TEST pushbutton switch<br>* after 3 second time delay (Ref. LOOP TEST Procedure, 26-13-00, P. Block 501). | On control module 20WG<br>- LOOP A legend comes on<br>- LOOP B legend comes on<br>- red warning light of APU FIRE handle comes on.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights flash<br>Continuous repetitive chime sounds.<br>On L ECAM display unit, message starting with APU FIRE appears. |
| R - release LOOP TEST pushbutton switch | On control module 20WG<br>- red warning light of APU FIRE handle goes off.<br>On CAPT and F/O main instrument |

| | ACTION | RESULT |
|---|---|---|
| R | | panels 3VU and 5VU |
| R | | - MASTER WARN lights go off |
| R | | - after 3.5 seconds, MASTER CAUTION |
| R | | lights come on and then go off. |
| R | | On L ECAM display unit |
| R | | - APU FIRE message disappears. |
| | - Pull APU FIRE handle | Continuous repetitive chime stops. |
| | | On control module 20WG |
| | | - SQUIB legend comes on |
| | | - LOOP A and LOOP B legends go off. |
| | | On APU section of panel 472VU |
| | | - OPEN legend of APU/ISOL VALVE annunciator goes off |
| | | - SHUT legend of APU/ISOL VALVE annunciator comes on. |
| | | On FUEL section of panel 430VU, on LP VALVES/APU annunciator |
| | | - flowbar goes off |
| | | - SHUT legend comes on. |
| R | - Push APU FIRE handle. | On control module 20WG |
| | | - SQUIB legend goes off. |
| | | On APU section of panel 472VU |
| | | - SHUT Legend of APU/ISOL VALVE annunciator goes off. |
| | | - OPEN legend of APU/ISOL VALVE annunciator comes on. |
| | | On FUEL section of panel 430VU on LP VALVES/APU annunciator. |
| | | - SHUT legend goes off. |
| | | - Flowbar comes on. |

E. Close-Up
(1)Connect plug 11WF.B.
- perform a SQUIB TEST (Ref. 26-22-00, P. Block 501).
(2)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

## AVIONICS COMPARTMENT SMOKE DETECTION - DESCRIPTION/OPERATION

1. General

(Ref. Fig. 001)

Avionics compartment smoke detection system comprises :

- ionization or optical smoke detectors installed on air extraction ducts (Ref. Fig. 002)
- an indicating and testing assembly enabling warning visualisation and checking of detection and indication circuits. Each detector triggers its corresponding warning light together with **MASTER WARN** lights flash on **CAPT** and **F/O** main instrument panels **3VU** and **5VU** and repetitive chime. The warning (level 3) appears on the **ECAM** display unit and the **ELEC DC** synoptic appears on the **ECAM** display unit. A fan allows the presence of smoke upstream of the battery fan to be confirmed in the flight compartment.

2. Component Location

(Ref. Fig. 003)

R **ON A/C 101-200,

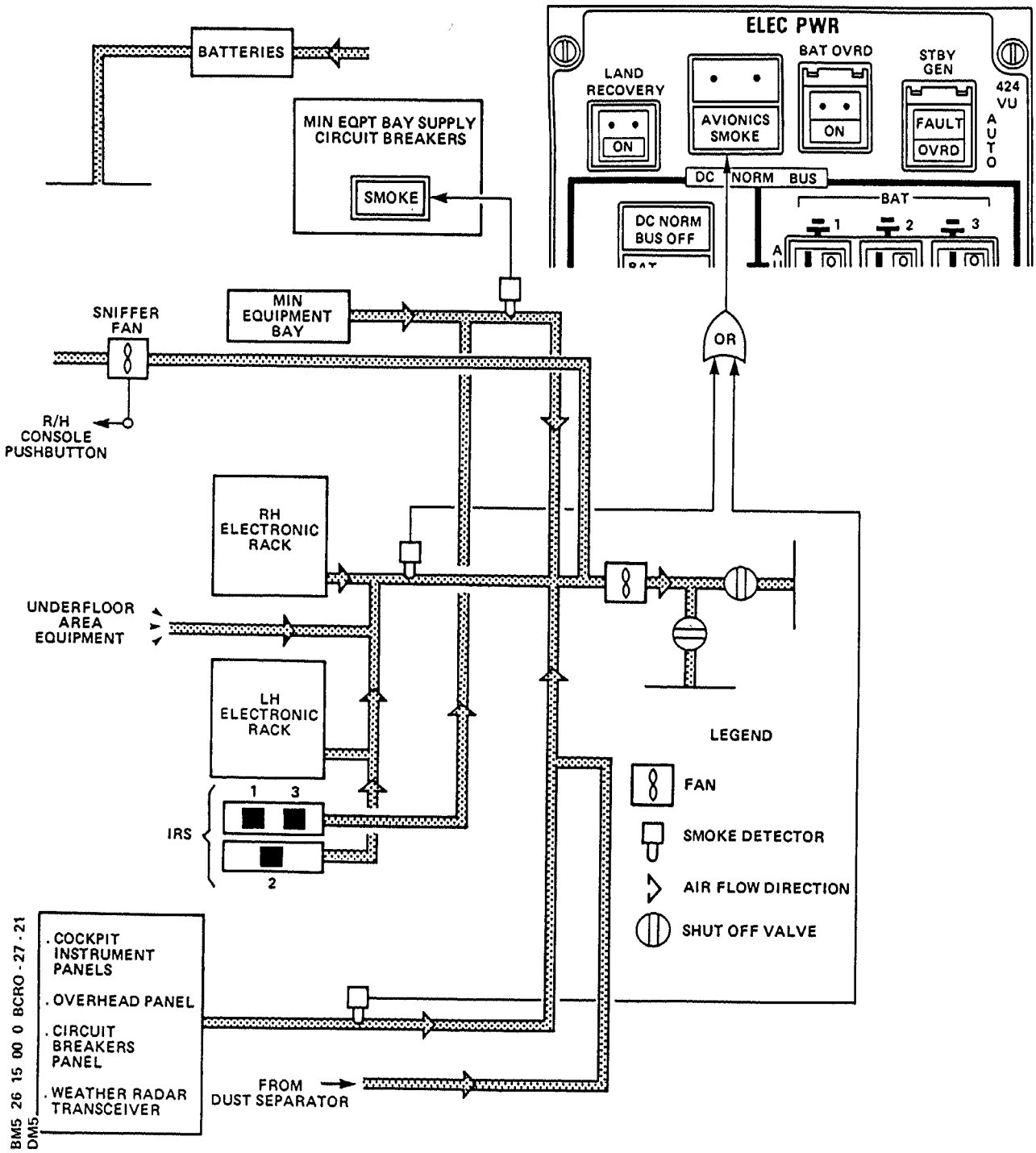
(Ref. Fig. 004)

R **ON A/C 001-100,

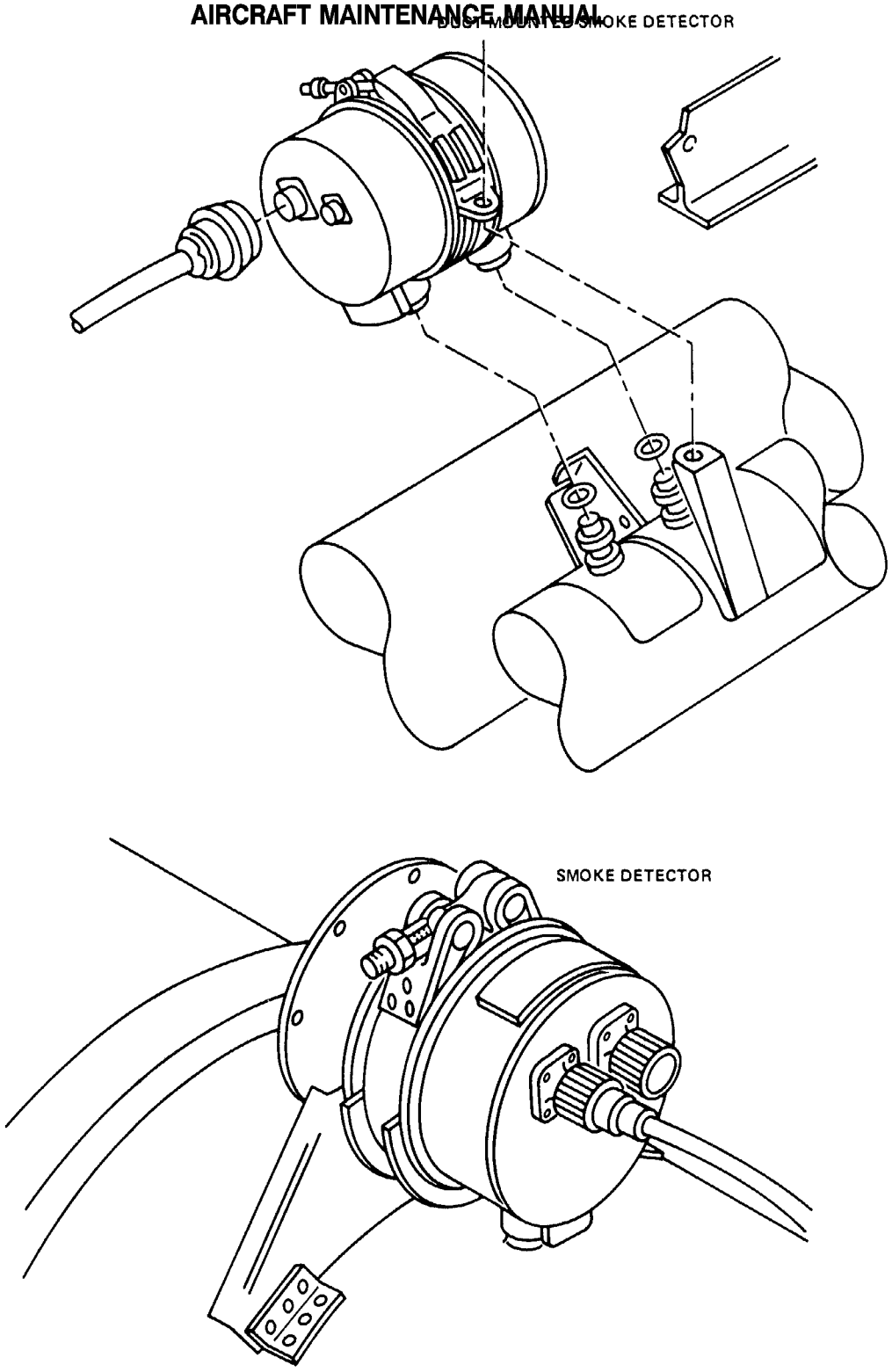
(Ref. Fig. 005)

R **ON A/C ALL

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 11WA | DET - DUCT SMOKE, MAIN BAY | | 133 | | 26-15-12 |
| 12WA | DET - DUCT SMOKE, MIN EQT BAY | | 134 | | 26-15-12 |
| 13WA | DET - DUCT SMOKE, COCKPIT | | 121 | | 26-15-12 |
| 16WA | SWITCH - SMOKE DET TEST SEL | 471VU | 212 | | 26-15-00 |
| 49WA | P/BSW - AVIONICS SMOKE | 424VU | 211 | | 26-15-00 |
| 50WA | P/BSW - SMOKE | 22VU | 211 | | 26-15-00 |
| 52WA | P/BSW - PTT | 471VU | 212 | | 26-15-00 |
| 55WA | P/BSW - SNIFFER FAN | 420VU | | | 26-15-21 |
| 56WA | FAN - SNIFFER | | 122 | 121BL | 26-15-21 |




Avionics Compartment Smoke Detection - Schematic
Figure 001

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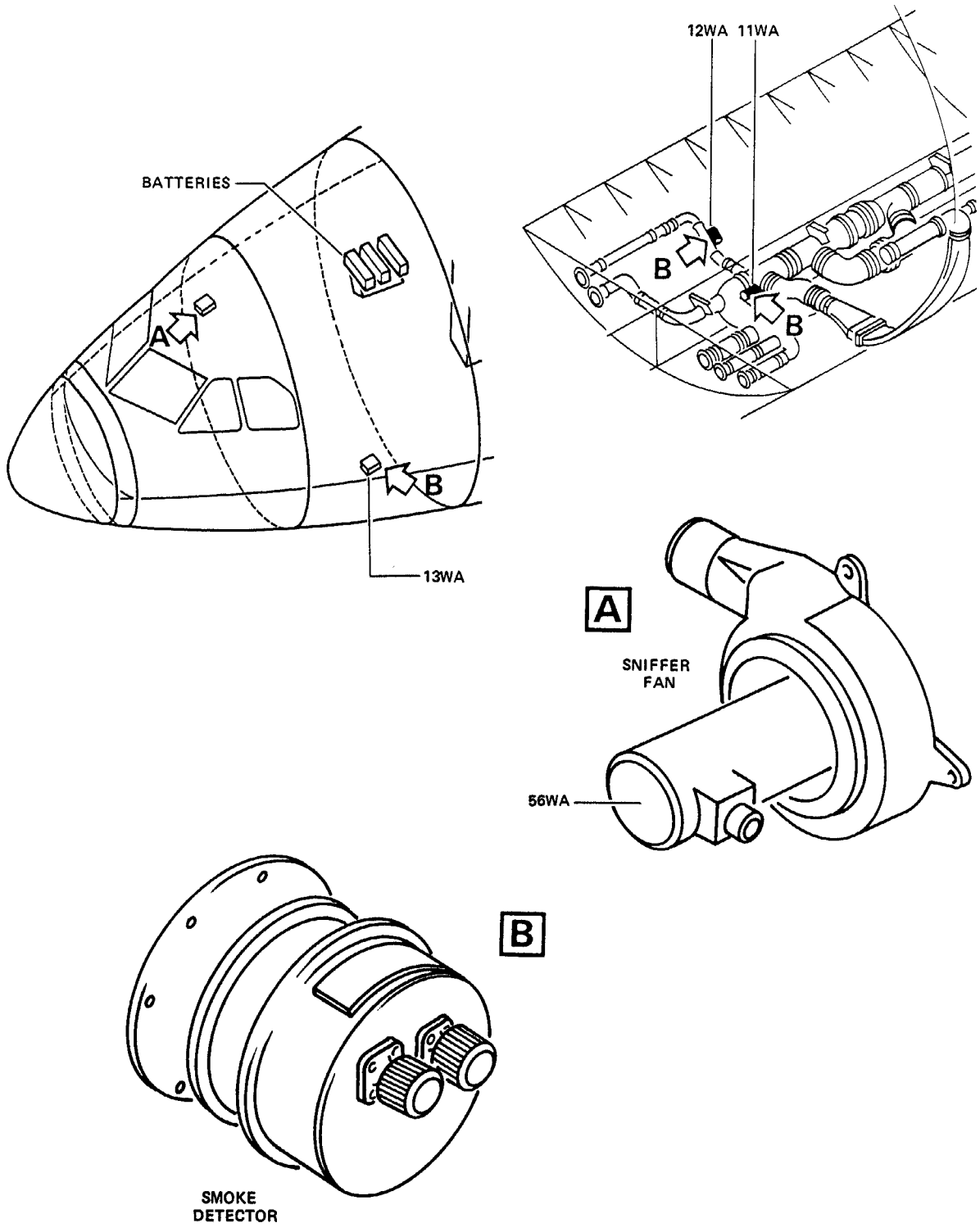
Duct Mounted Smoke Detector
Figure 002

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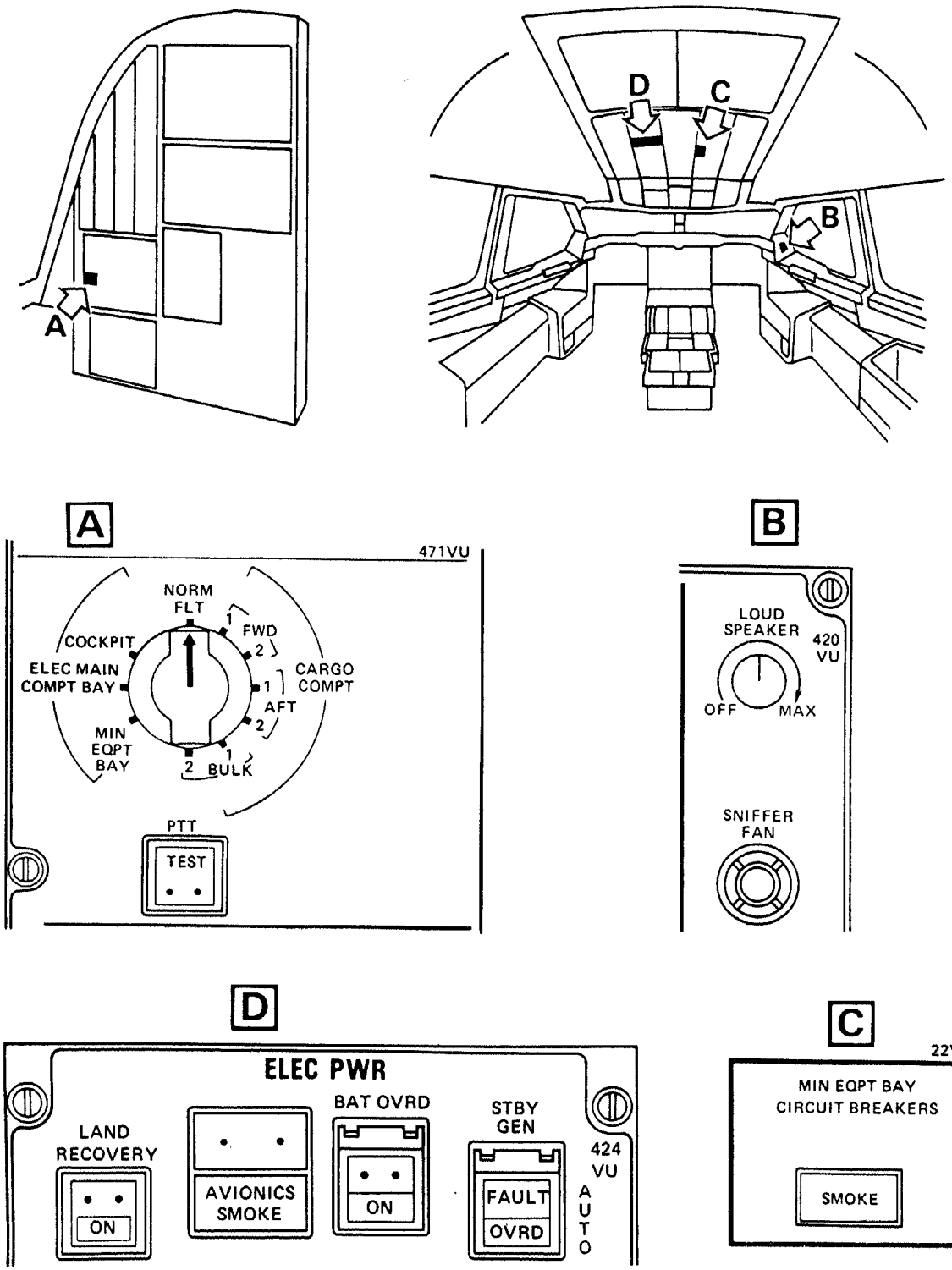
Avionics Compartment Smoke Detection - Location
Figure 003

R

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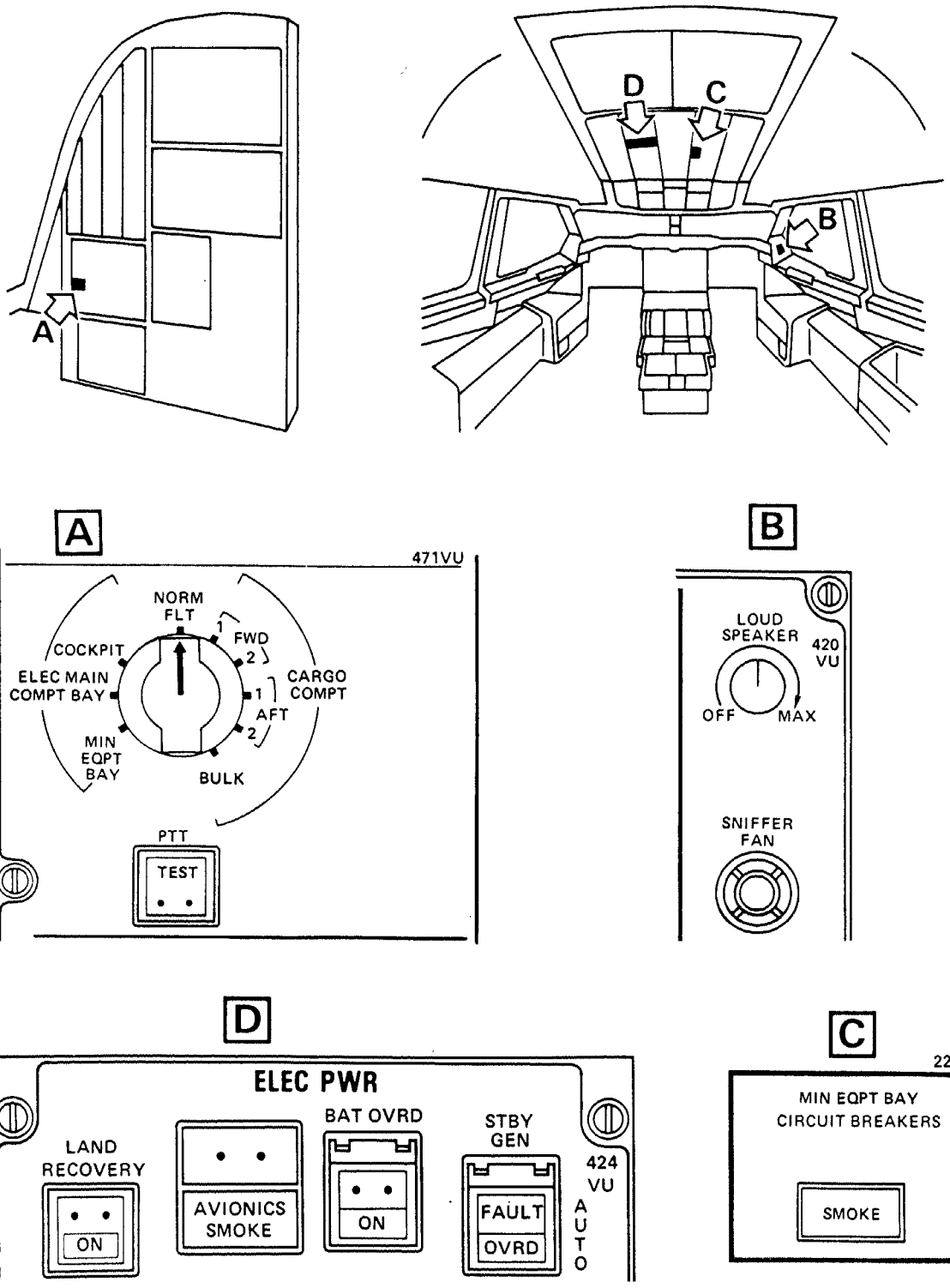
Avionics Compartment Smoke Detection - Panels
Figure 004

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Avionics Compartment Smoke Detection - Panels
Figure 005

3. Description

A. Principle (Ref. Fig. 006)

Detection is carried out by smoke detectors which are of the ionization or optical types.

(1) Ionization type smoke detectors

The ionization type is composed of:
- a measurement chamber in which enters the air to be analyzed
- a reference resistor

The chamber is ionized by a source of extremely low radioactivity. When smoke gases enter the detector, they modify the balance between the resistor and the ionized chamber which causes a variation from the detector normal voltage. From the reference setting threshold of the measurement chamber, the detector inner electronic circuit sends a signal to the corresponding flight compartment warning. Detectors are self-contained; they are directly connected (without intermediate control unit) to the flight compartment.

(2) Optical type smoke detectors

The heart of the smoke detector is a high quality optical measurement chamber that screens external parasite light but optimally detects light colored and dark smoke particles. The smoke detection is based on the scattered light principle.

The light source (IR LED), the light trap (or light stop) and the light receiver are arranged in such a way that the light from the emitter cannot directly reach the receiver. Only when smoke particles are present in the optical path, some of the scattered light reaches the photoreceiver and produces an electrical signal. A sophisticated labyrinth enables the light trap to be efficient and react to false alarms such as parasite light.

Brief light pulses (100 $\mu$s) are transmitted periodically by the IR LED into the scattering chamber.

The wavelength of the light is 880 nm (near infrared) in order to optimise the detection efficiency.

Finally, the photodiode receives scattered light and converts it into an electrical signal, to be processed by the electronics.

B. Detection System - Components (Ref. Fig. 007)

(1) Three duct smoke detectors installed on air extraction ducts of the following racks and equipment (Ref. table below).

| Monitored Rack or Equipment | Number of Detectors | Warning Light Designation | Warning Light Location |
|---|---|---|---|
| Pilots panels, circuit breaker panel, main racks, relay boxes, AC and DC transformer/rectifiers, static inverters, inertial navigation system 2 | 2 | AVIONICS SMOKE | Overhead panel 424VU |
| Minimum equipment bay (shelf 96VU), | 1 | SMOKE | Essential |

| Monitored Rack or Equipment | Number of Detectors | Warning Light Designation | Warning Light Location |
|---|---|---|---|
| INS 1 and 3 | | | circuit breaker |

C. Operation

R **ON A/C 001-100,

(Ref. Fig. 008, 006)

R **ON A/C 101-200,

R (Ref. Fig. 009, 006)

R **ON A/C ALL

(1)Operation in warning configuration (Ref. Fig. 010)

(a)Ionization type smoke detectors

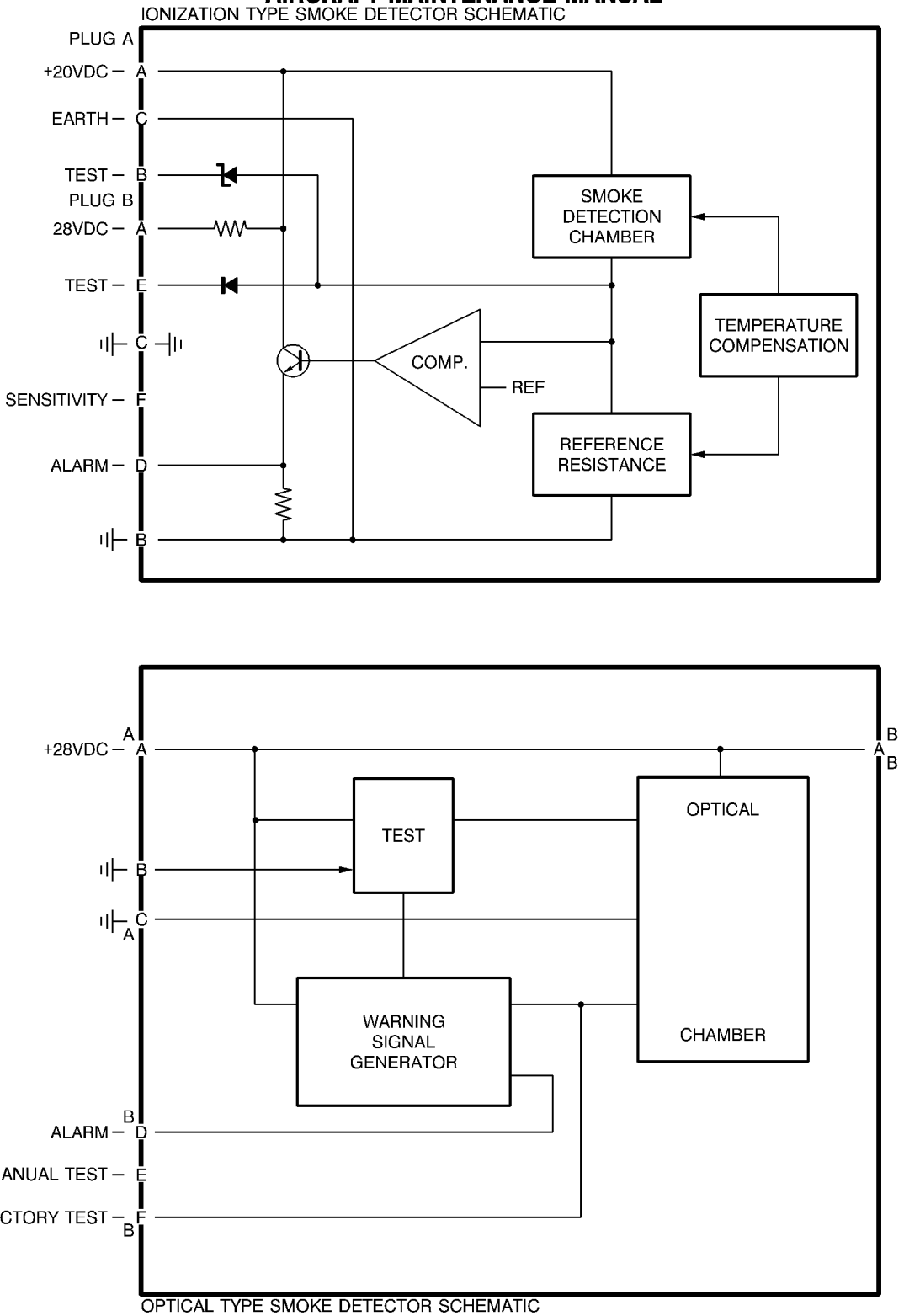
The warning circuit comprises :
- a resistor series connected in the smoke detector supply line
- a temperature compensation
- an electronic circuit connected to the resistor.

In normal operation, a permanent current goes through the resistor on smoke detector line.
The smoke detector reacts to the first fire outset, i.e. combustion gases, visible or invisible, which are produced at the very beginning of afire. When gases enter the detector, they modify the balance between the resistor and the ionized chamber.
This modification is measured by a field effect transistor which triggers the warning by means of the smoke detection control unit as soon as the sensitivity threshold is reached.
The sensitivity is given by the bias voltage increase in the measurement chamber : this voltage is adjustable and can be adapted according to the ambient conditions.
When the alarm threshold is reached, the voltage rise at resistor pins triggers the associated electronic circuit without self maintain of the alarm configuration together with the following warnings :
- illumination of the corresponding warning light at the overhead panel
- **MASTER WARN** lights come on **CAPT** and **F/O** main instrument panels **3VU** and **5VU**.
- repetitive chime
- warning display and electric **DC** synoptic on the **ECAM** display units.

In case of illumination of red **SMOKE** warning lights on the overhead panel, the crew members operate the fan using **MIN EQPT BAY SNIFFER FAN** switch on panel 22VU to have the olfactory confirmation of smoke upstream of the battery fan (Ref. Fig. 011)

(b)Optical type smoke detectors

The alarm output (discrete signal) is activated when the alarm

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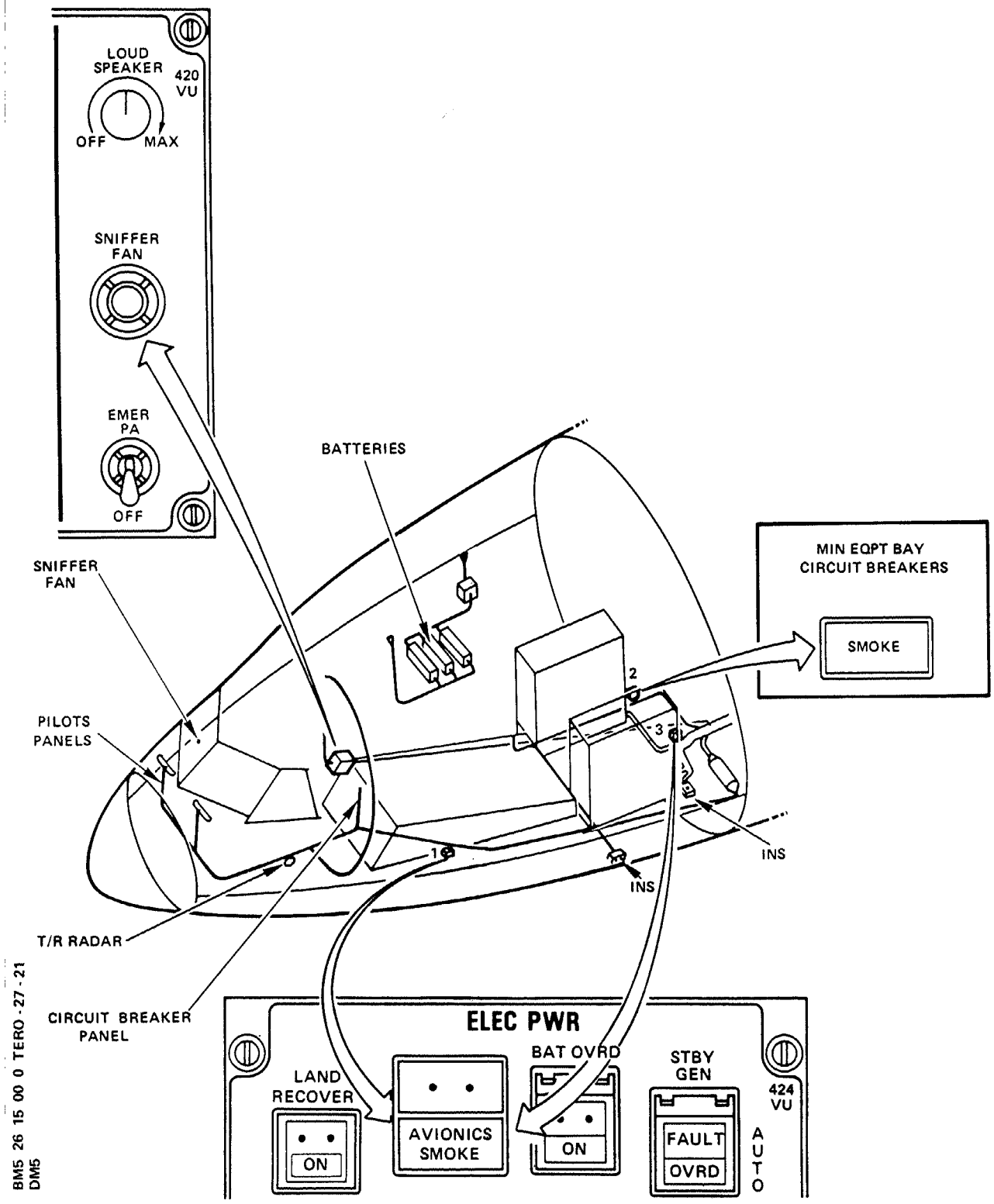
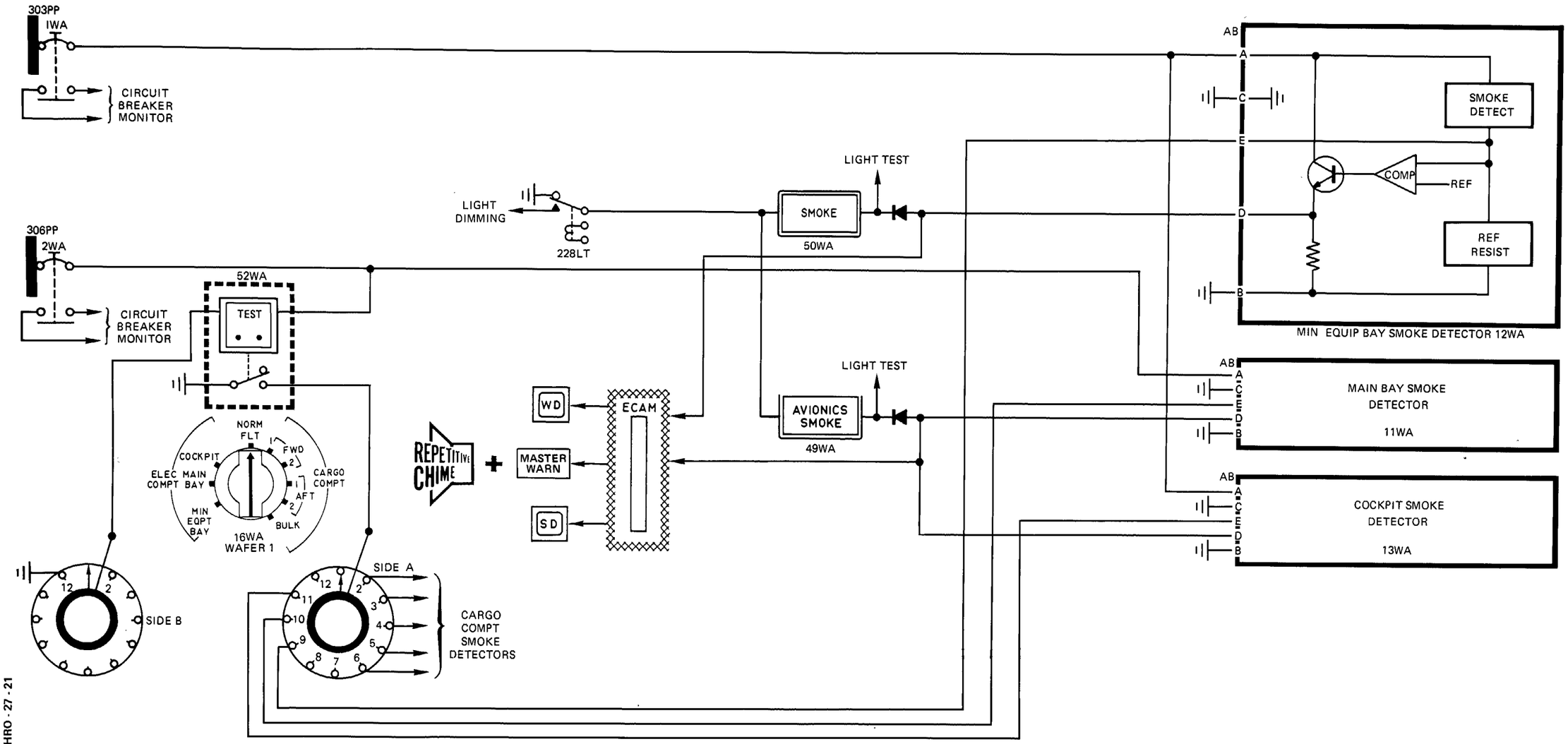
Smoke Detector - Schematic
Figure 006




Avionics Compartment Smoke Detection - Schematic
Figure 007

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Avionics Compartment Smoke Detection -
Electrical Circuit
Figure 008

R EFFECTIVITY: 001-100,

PIA



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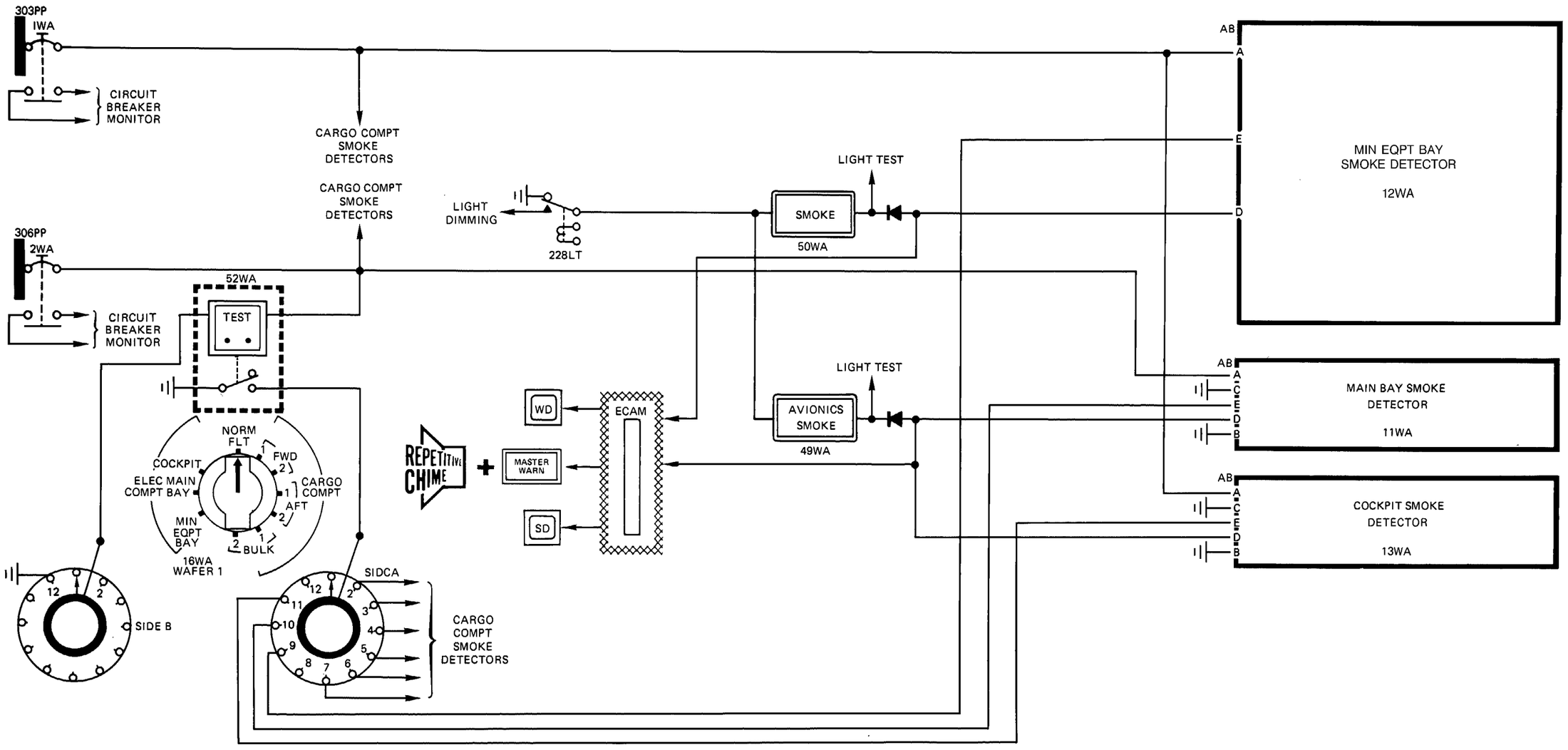


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Avionics Compartment Smoke Detection -
Electrical Circuit
Figure 009

R

R EFFECTIVITY: 101-200,

PIA



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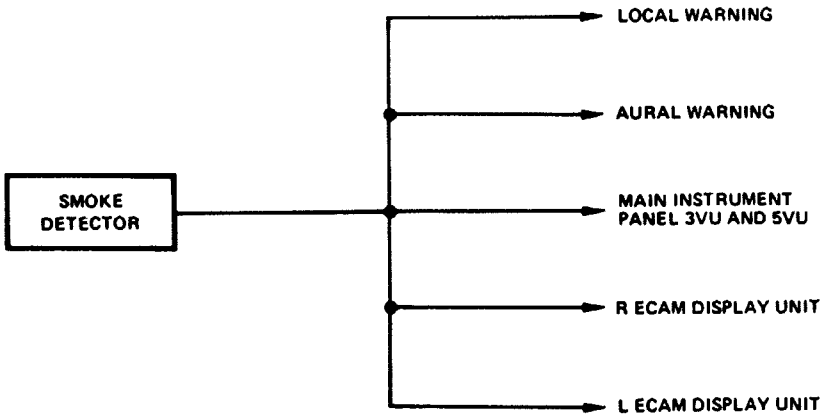
threshold is reached.
As the smoke detector operates in autonomous mode, the corresponding warnings are directly triggered by means of relays to the flight compartment.
When the alarm threshold is reached, the smoke detector triggers the following warnings:
- illumination of the corresponding warning light at the overhead panel
- illumination of **MASTER WARN** lights on **CAPT** and **F/O** main instrument panels **3VU** and **5VU**
- repetitive chime
- warning display on the L **ECAM** display unit and **ELEC DC** page on the **R ECAM** display unit.

In case of illumination of the red **SMOKE** warning lights on the overhead panel, the crew members operate the fan using **MIN EQPT BAY SNIFFER FAN** switch on panel 22VU to have the olfactory confirmation of smoke upstream of the battery fan (Ref. Fig. 011).

(2)Operation in test configuration

(a)Test of **SMOKE** warnings

Warning circuitry is tested by placing the ten-position **ELEC & CARGO COMPT SMOKE DET** selector switch in the detection circuit position to be checked and by pressing **PTT** pushbutton switch.
The test is correct if the corresponding **SMOKE** warning light comes on and **MASTER WARN** lights come on **CAPT** and **F/O** main instrument panels **3VU** and **5VU** with repetitive chime.

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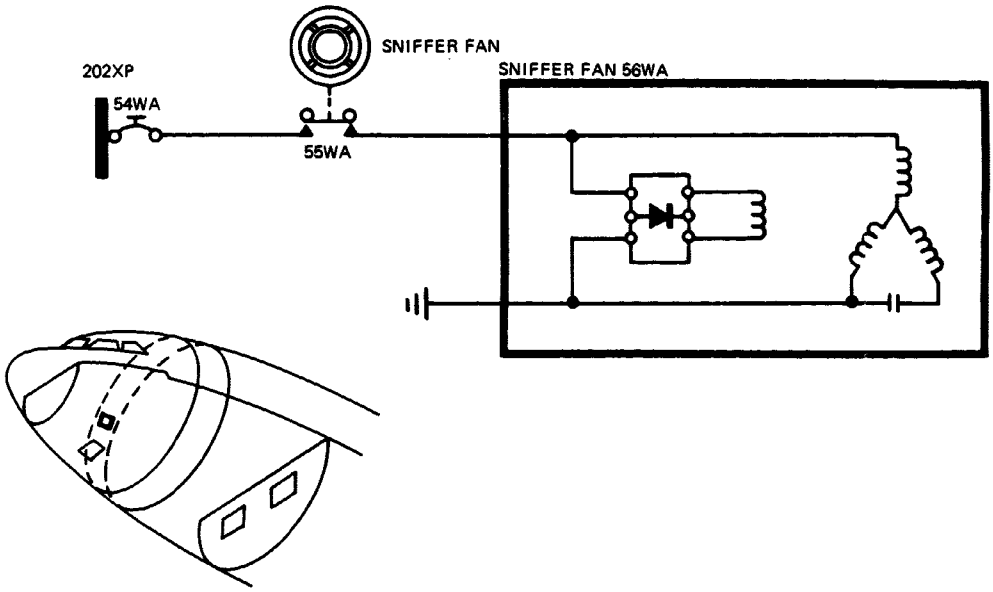
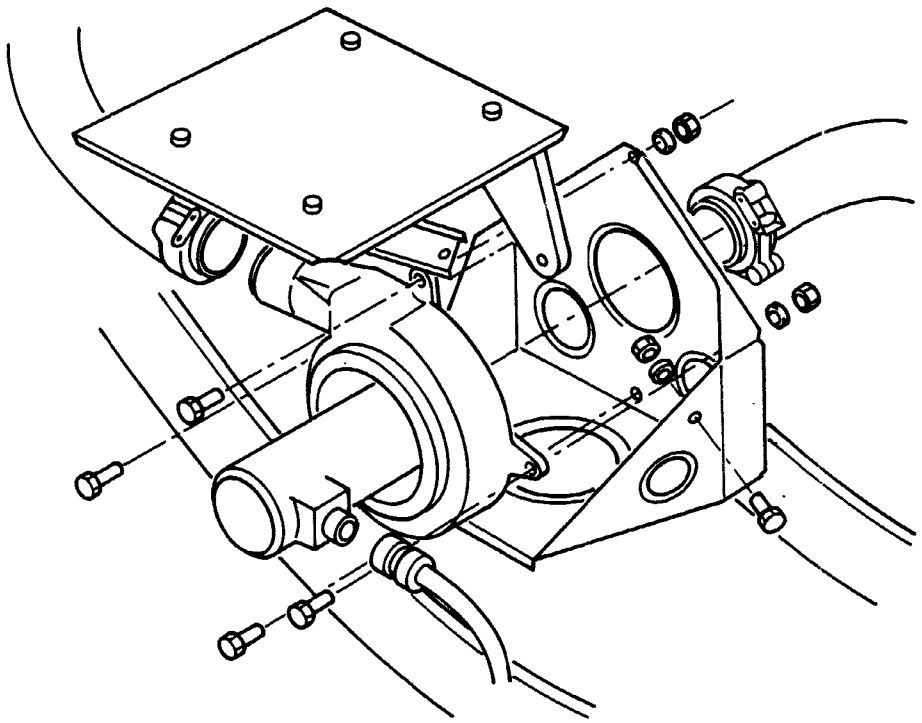
Avionics Compartment Smoke Detection - Warning Configuration
Figure 010



8M5 26 15 00 0 AKMO

Sniffer Fan System
Figure 011

1. Operational Test of Smoke Detection System

A. Reason for the Job

R Operational check of all smoke detection channels including associated
R warnings.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedures | |
| - 21-21-00, P. Block 301 | Flight Compartment and Electronics Racks Air Distribution |
| - 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure

(1)Job set-up

(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Make certain that electronics racks ventilation is correct (Ref. 21-21-00, P. Block 301).

(c)Close overhead panel circuit breakers, particularly those associated with cargo compartment smoke detection and ECAM.

(2)Test

| ACTION | RESULT |
|---|---|
| On maintenance panel 471VU<br>1. place ELEC & CARGO COMPT SMOKE DET selector switch 16WA in ELEC COMPT/COCKPIT position | On maintenance panel 471VU<br>- TEST legend of PTT pushbutton switch comes on |
| 2. Press PTT pushbutton switch | On panel 424VU<br>- AVIONICS SMOKE warning light comes on<br>On CAPT and F/O main instrument panels 3VU and 5VU.<br>- MASTER WARN lights come on.<br>Repetitive chime sounds<br>On ECAM DISPLAY UNIT<br>- message starting with SMOKE appears |
| 3. Release TEST pushbutton switch | All annunciator lights mentioned above go off.<br>Repetitive chime stops |
| 4. Repeat actions described in steps 1, 2 & 3 above, placing test selector switch successively in the following positions depending on smoke detector to be tested | Results are simular to those of steps 1, 2 & 3 with illumination and extinguishing of warning light corresponding to position of test selector switch. (Ref. following |

| ACTION | RESULT |
|---|---|
| (Ref. following table). | table). |
| 5. Place smoke detector test selector switch 16WA in NORM FLT position | On maintenance panel 471VU<br>- TEST legend of PTT pushbutton switch goes off |

| POSITION OF TEST SELECTOR SWITCH | WARNING LIGHTS CONCERNED | PANEL |
|---|---|---|
| ELEC COMPT/MAIN BAY | AVIONICS SMOKE | 424VU |
| ELEC COMPT/MIN EQPT | SMOKE | 22VU |

(3)Close-up
(a)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Restore system and aircraft to normal operating conditions.

1. Reason for the Job
To remove and clean avionics compartment smoke detectors.

2. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform 2.7 to 3.0 m (9.0 to 10.0 ft.) |
| B. | Vendor CMM |
| Referenced Procedures | |
| - 26-15-00, P. Block 501 | Avionics Compartment Smoke Detection |
| - 26-15-12, P. Block 401 | Smoke Detector |

3. Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AVIONICS/SMOKE DET/DETECTORS | 1WA | 204/F25 |
| 22VU | AVIONICS/SMOKE DET/DETECTORS | 2WA | 204/F26 |

(2)Position access platforms :
(a)At FWD cargo compartment door for smoke detector 13WA.
(b)At access door 134AR for smoke detectors 11WA and 12WA.
(3)Open access doors :
(a)FWD cargo compartment door, then access door 131AZ for smoke detector 13WA.
(b)Access door 134AR for smoke detectors 11WA and 12WA.

B. Cleaning of Smoke Detector
(1)Remove smoke detector (Ref. 26-15-12, P. Block 401).
(2)Clean smoke detector in workshop (Ref. Vendor CMM).
(3)Install smoke detector (Ref. 26-15-12, P. Block 401).

C. Test
(1)Remove safety clips and tags and close circuit breakers 1WA and 2WA.
(2)Carry out operational test of avionics compartment smoke detection (Ref. 26-15-00, P. Block 501).

D. Close-Up
(1)Make certain that work area is clean and clear of tools and other items.
(2)Close access doors :
(a)Access door 131AZ then FWD cargo compartment door for smoke detector 13WA.

(b)Access door 134AR for smoke detectors 11WA and 12WA.

(3)Remove access platforms.

Not applicable

WARNING : RADIOACTIVITY
THE COMBUSTION GAS DETECTOR CONTAINS RADIOACTIVE AMERICIUM 241, OF APPROXIMATELY 0.4 MICROCURIES.
OPENING OR REPAIR OF SMOKE DETECTORS MUST ONLY BE CARRIED OUT IN WORKSHOPS AUTORIZED BY THE MANUFACTURER.

NOTE : Removal/installation procedures to be carried out in two methods.
The first method is applicable to detector 13WA and the second method is applicable to 11WA, 12WA, because of difficult access to clamp nut.

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform |
| B. | Circuit Breaker Safety Clips |
| C. | O-Rings (NSA 8205-114) |
| D. | Electrical Connector Blanking Caps |
| R E. Material No.04-011 | Common Greases (Ref. 20-31-00) |
| Referenced Procedure<br>- 26-15-00, P. Block 501 | Avionics Compartment Smoke Detection |

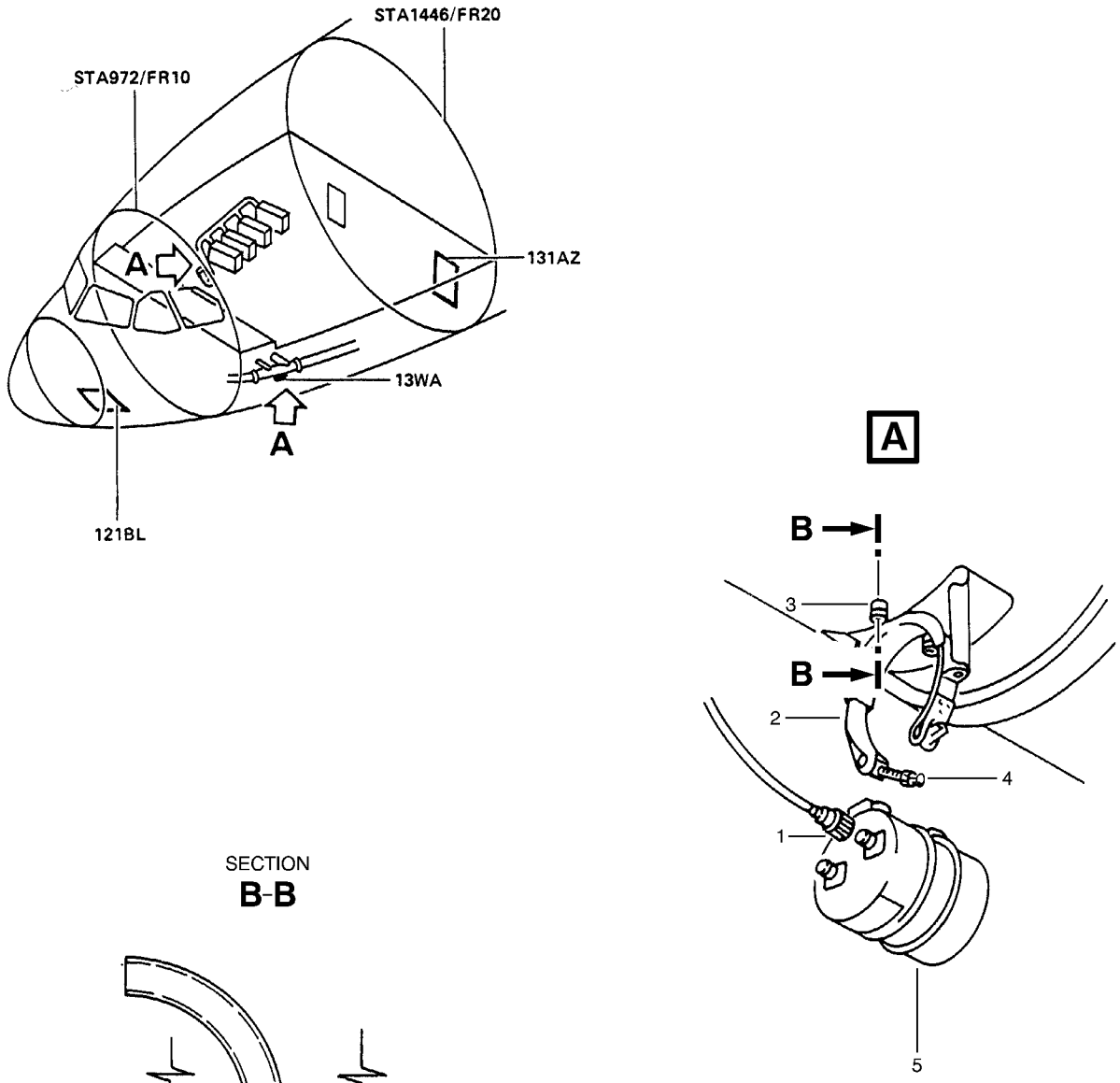
2. Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AVIONICS/SMOKE DET/DETECTORS | 1WA | 204/F25 |
| 22VU | AVIONICS/SMOKE DET/DETECTORS | 2WA | 204/F24 |

(2)Position access platforms
(a)At FWD cargo compartment door for smoke detector 13WA.
(b)At access door 134AR for smoke detectors 11WA and 12WA.
(3)Open access door
(a)Of FWD cargo compartment, then 131AZ for smoke detector 13WA.
(b)134AR for smoke detectors 11WA and 12WA.

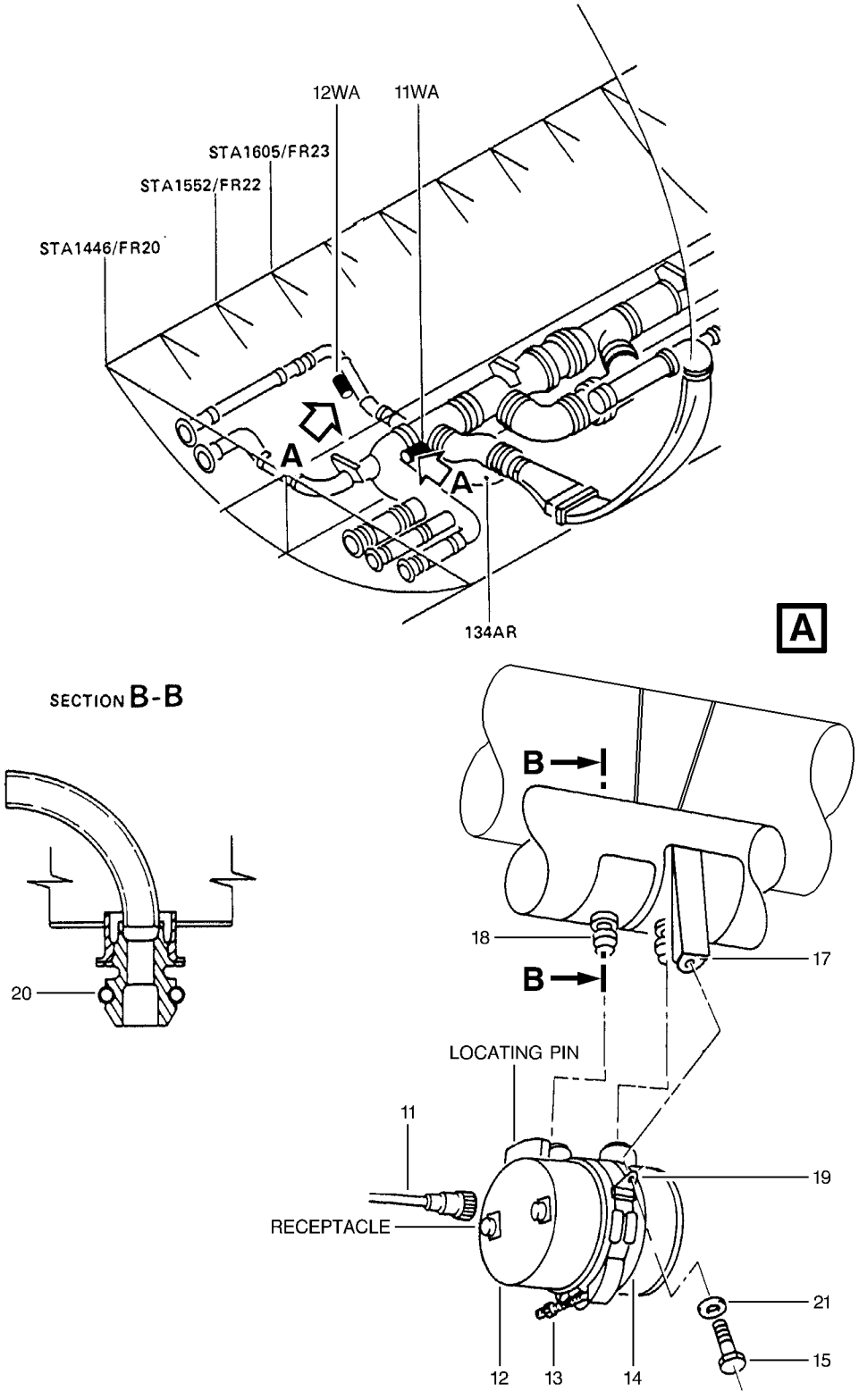
B. Removal
(1)First method (Ref. Fig. 401)
(a)Disconnect connector (1) and install blanking cap.
(b)Unscrew locknut (4) until detector attachment clamp (2) is completely free.
(c)Remove detector (5) by lifting it perpendicularly off the ventilation duct and discard O-ring (6) on each ventilation duct union (3). Install blanking caps.
(2)Second method (Ref. Fig. 402)
(a)Disconnect connector (11) and install blanking cap.
(b)Remove screw (15). Recover screws and washers.




BM5 26 15 12 4 BAR0 01

Duct Smoke Detector - Removal/Installation
Figure 401

R




BM5 26 15 12 4 BBM0 02

Duct Smoke Detector - Removal/Installation
Figure 402

R

(c)Remove detector (12) by lifting it perpendicularly off the ventilation duct and discard O-rings (20) from each ventilation duct union (18). Install blanking caps.
NOTE : Il a replacement component is to be installed, clamp, screws, washers have to be reused.

C. Preparation of Replacement Component
(1)Visually inspect smoke detector.
(2)Remove blanking caps from electrical receptacle and from air bleed tubes.
(3)Make sure that the air bleed tubes have no blockage. If necessary, clean the output/input tubes with compressed air.

D. Preparation of Installation
(1)First method
(a)Remove blanking caps from ventilation duct unions (3)
(b)Check, on detector attachment clamp (2), that bonding strip is stripped clean over a width of 15 mm (0.59 in.).
(2)Second method
(a)Remove blanking caps from ventilation duct unions (18).
(b)Untighten locknut (13) so that smoke detector can be moved inside clamp (14).

E. Installation
(1)First method (Ref. Fig. 401)
R (a)Apply a thin layer of silicone grease (Material No. 04-011) to a new
R O-ring (6).
R (b)Install a new O-ring (6) on both ventilation duct unions (3).
R (c)Open detector attachment clamp (2) wide.
R (d)Install detector (5) in position on detector attachment clamp (2) so that locating pin does not interfere with correct engagement of air
R bleed tubes on respective ventilation duct unions (3).
R (e)Close detector attachment clamp (2).
R (f)Connect connector (1).
(2)Second method (Ref. Fig. 402)
(a)Install a new O-ring (20) on both ventilation duct unions (18).
(b)Install detector (12) on attach fitting (17) so that locating pin positioning enables a correct engagement of air bleed ducts on respective ventilation duct unions (18).
(c)Position clamp (14) so that attach lug (19) holes match with attach fitting (17) holes.
(d)Tighten locknut (13) on clamps (14).
NOTE : In case of uneasy access to locknut (13), proceed as follows :
- mark position of clamp of detector body
- remove detector
- if necessary, adjust position on clamp on detector
- tighten nut
- install detector as detailed in para. 2.D.(2)(c).
(e)Secure detector on support (17) with screws (15).
(f)Connect connector (11) to detector.

F. Test

(1)Remove safety clips and tags and close circuit breakers 1WA and 2WA.
(2)Carry out operational test of smoke detector (Ref. 26-15-00, P. Block 501).

G. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Clean working area if necessary.
(3)Close access door.
(a)Either access door 131AZ then FWD cargo compartment door for detector 13WA.
(b)Or access door 134AR for detectors 11WA and 12WA.
(4)Remove access platform.

SMOKE DETECTION SNIFFER FAN - Removal/Installation

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clip |
| B. | Blanking Plugs/Caps |

2. Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breaker :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | VENT/SNIFFER/FAN | 54WA | 202/H18 |

(2)Open door 121BL for access to avionics compartment.

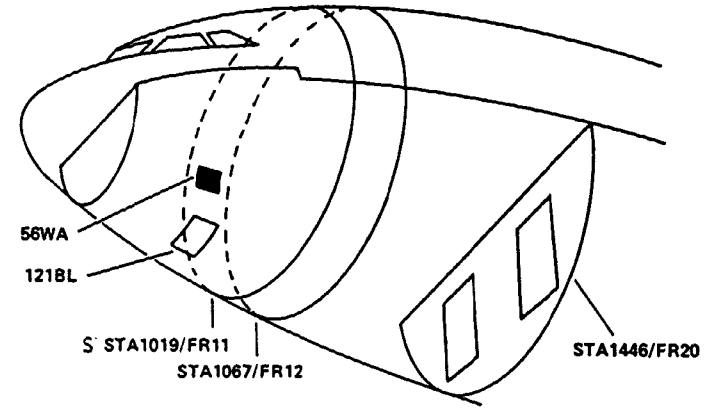
B. Removal (Ref. Fig. 401)
(1)Disconnect plug (7). Install protective cap.
(2)Loosen retaining nuts on each clamp (4) and (10) until the two coupling assemblies are completely freed.
(3)Disengage coupling assemblies and check condition of seal incorporated in each of them. It either seal faulty discard corresponding coupling.
(4)Remove the two lateral attachment nuts (5) of cover (1) and the two nuts (3) attaching fan and cover to support plate (6). Remove corresponding bolts (8).
(5)Remove protective cover (1).
(6)Remove other nuts and bolts (9) attaching fan to support plate (6).
(7)Remove fan from support plate (6).

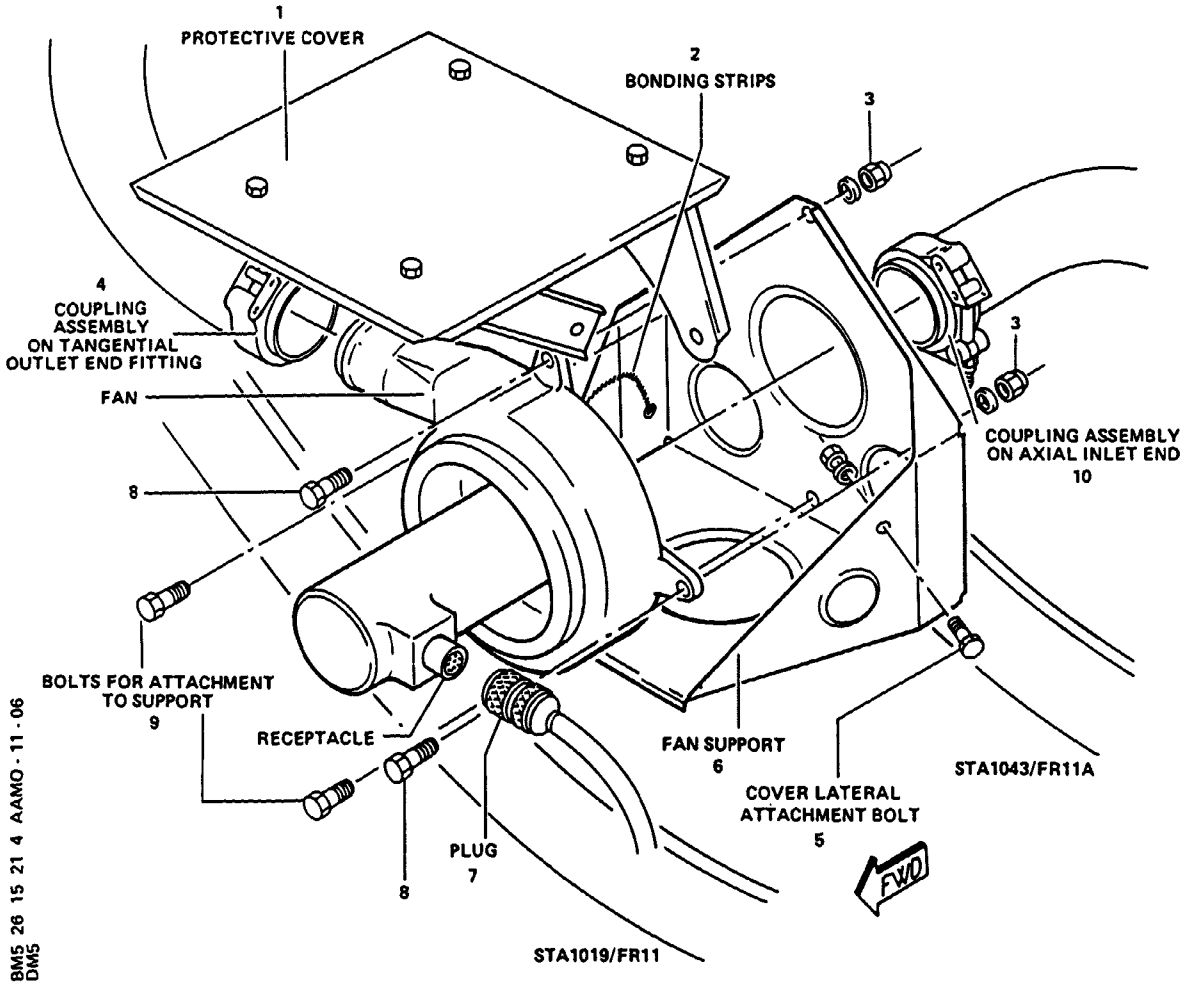
C. Installation (Ref. Fig. 401)
(1)Remove plugs or caps from inlet and outlet ends of fan and from receptacle.
(2)Position fan on its support (6).
(3)Engage two bolts (9) attaching support (6) only.
Position bonding strip (2) and tighten retaining nuts.
(4)Position cover (1).
(5)Engage two bolts (8) attaching fan and cover (1) to support (6) together with cover side attach bolts (5) in their respective housings. Tighten the corresponding nuts.
(6)Install the two coupling assemblies fitted with a sound seal and connect inlet and outlet duct ends to ventilation ducts. Install clamps (4) and (10) on each coupling and tighten retaining nuts.
(7)Connect plug (7).

R D. Test
R (1)Remove safety clip and tag and close circuit breaker 54WA.
R (2)Carry out a functional test of fan

R - on panel 420VU press SNIFFER FAN pushbutton switch
R - check that fan turns : air flow is felt at end of flexible duct
R located at RH lateral panel.

R E. Close-Up
R (1)Make certain that working area is clean and clear of tools and miscella-
R neous items of equipment.
R (2)Clean working area if necessary.
R (3)Close access door 121BL.




Sniffer Fan - Removal/Installation
Figure 401

# CARGO COMPARTMENT SMOKE DETECTION - DESCRIPTION AND OPERATION

## 1. General

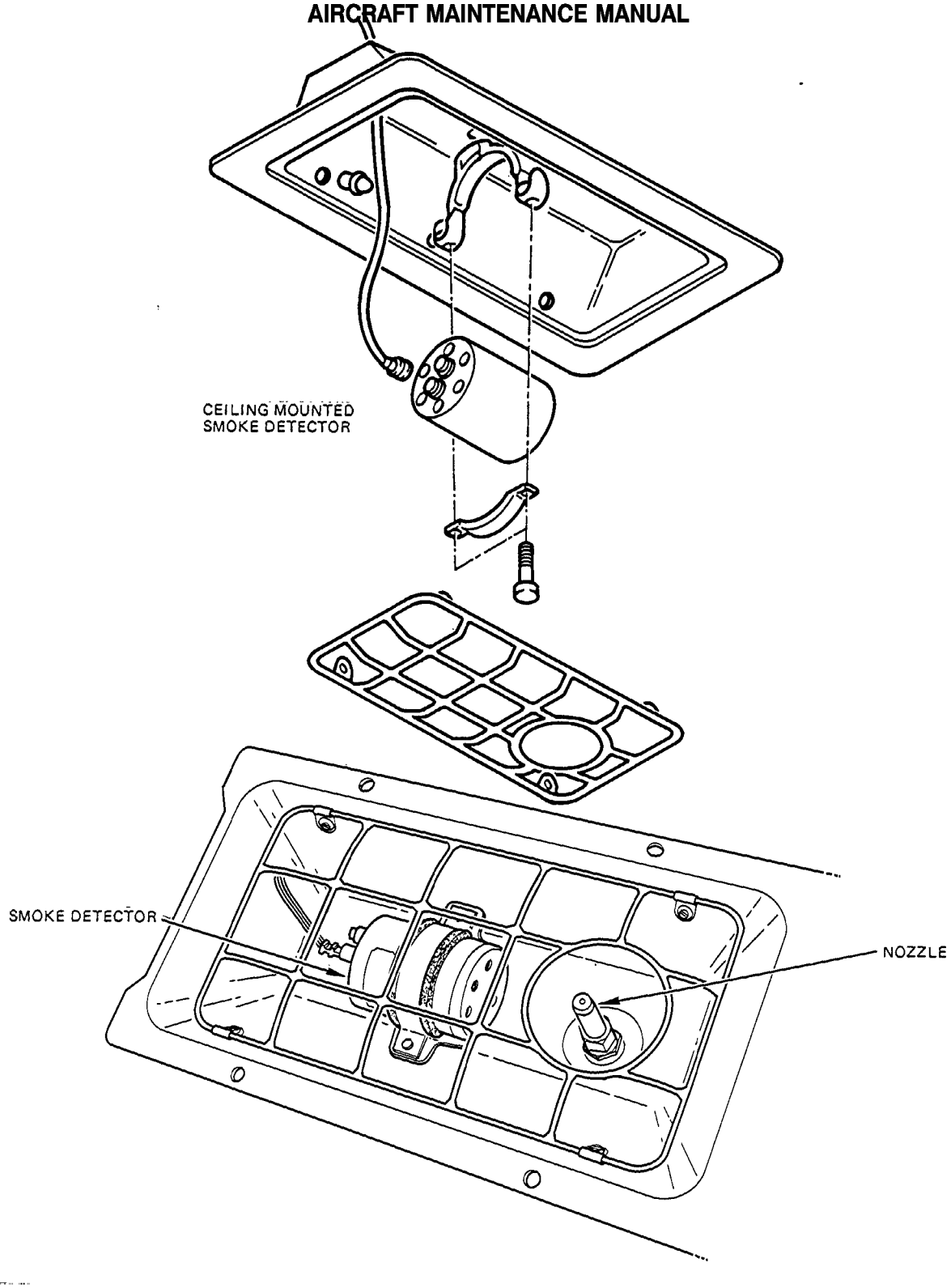
Cargo compartment smoke detection system consists of :

R - ionization or optical smoke detectors installed in cargo compartment
R ceiling
(Ref. Fig. 001)
- one indicating and testing assembly (Ref. Fig. 002)
  . to display warnings
  . to check detection and monitoring circuits
  . to show closure of bulk cargo compartment ventilation (Ref. Fig. 003)

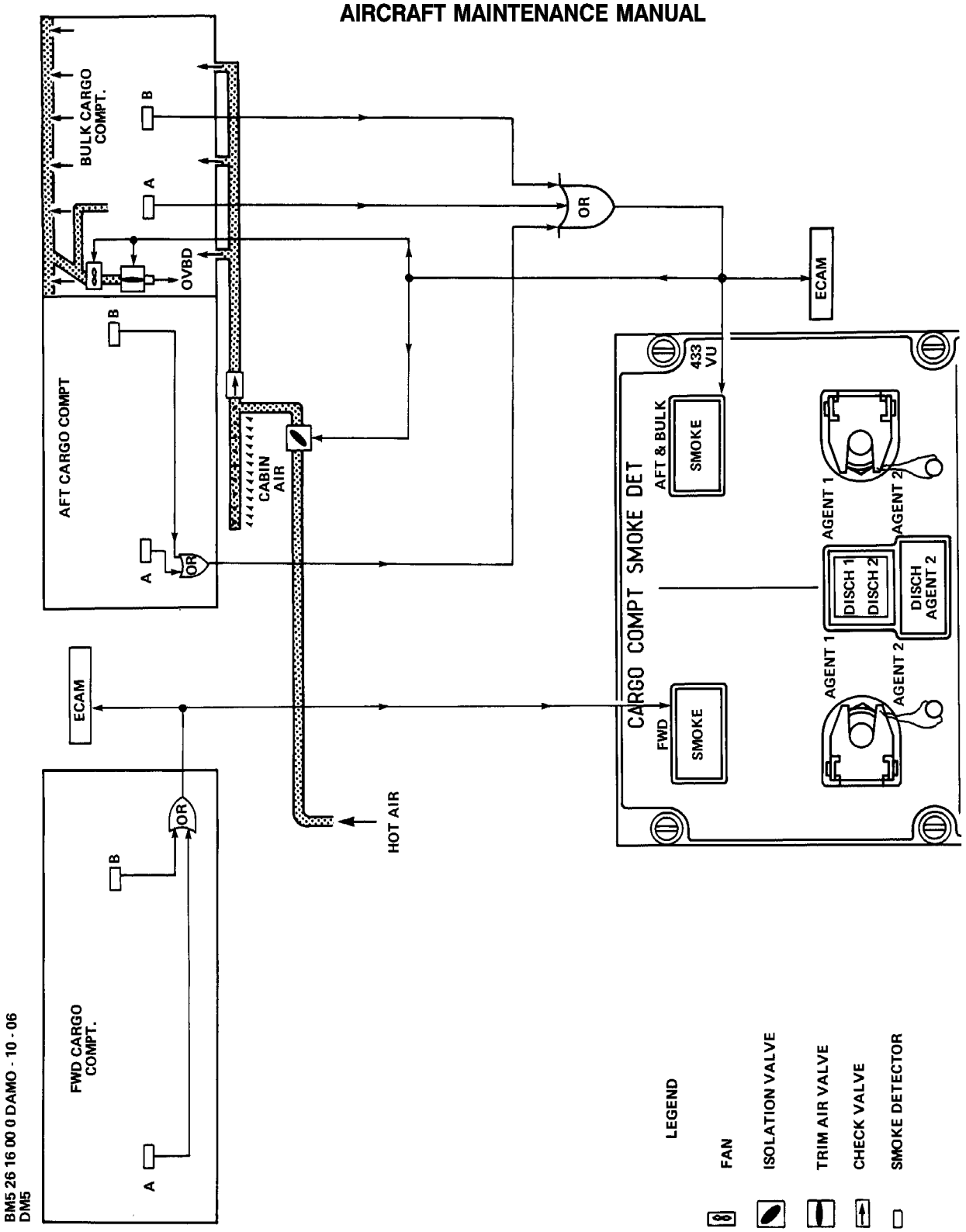
## 2. Component Location

(Ref. Fig. 004)
(Ref. Fig. 005)

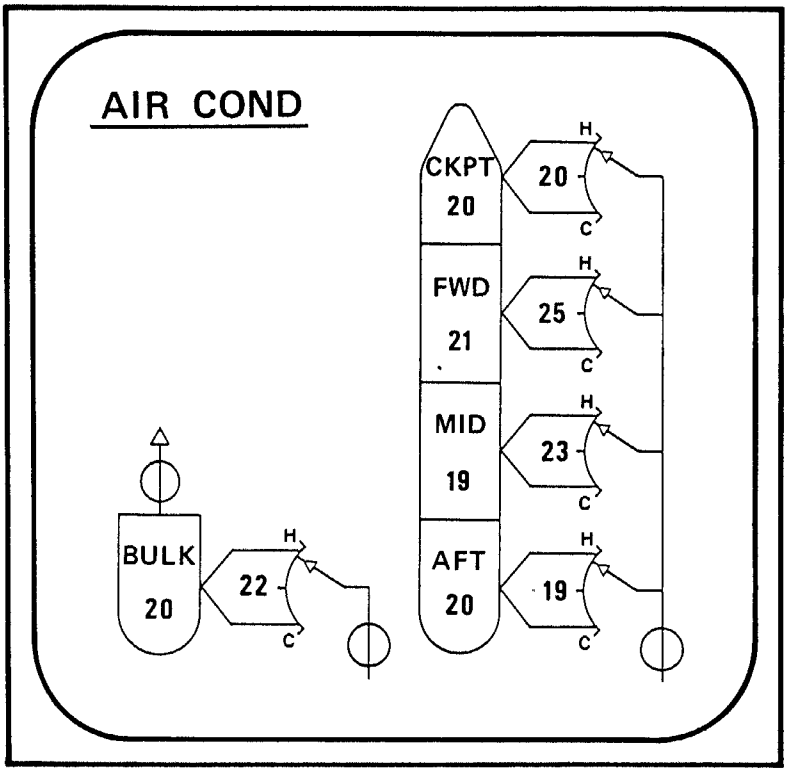
| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 3WH | DET - COMPT SMOKE, FWD CARGO | | 131 | | 26-16-11 |
| 9WH | DET - COMPT SMOKE, AFT CARGO | | 151 | | 26-16-11 |
| 10WH | DET - COMPT SMOKE, BULK CARGO | | 151 | | 26-16-11 |
| 11WH | DET - COMPT SMOKE, BULK CARGO | | 151 | | 26-16-11 |
| 42WH | DET - COMPT SMOKE, FWD CARGO | | 132 | | 26-16-11 |
| 44WH | DET - COMPT SMOKE, AFT CARGO | | 152 | | 26-16-11 |
| 38WH | WARNING LIGHT - CARGO COMPT SMOKE DET/ AFT & BULK/SMOKE | 433VU | 211 | | 26-16-00 |
| 39WH | WARNING LIGHT - CARGO COMPT SMOKE DET/ FWD/SMOKE | 433VU | 211 | | 26-16-00 |
| 16WA | SWITCH - SMOKE DET TEST SEL | 471VU | 212 | | 26-16-00 |
| 52WA | P/BSW - PTT | 471VU | 212 | | 26-16-00 |




Ceiling Mounted Smoke Detector
Figure 001




Cargo Compartment Smoke Detection - Schematic
Figure 002

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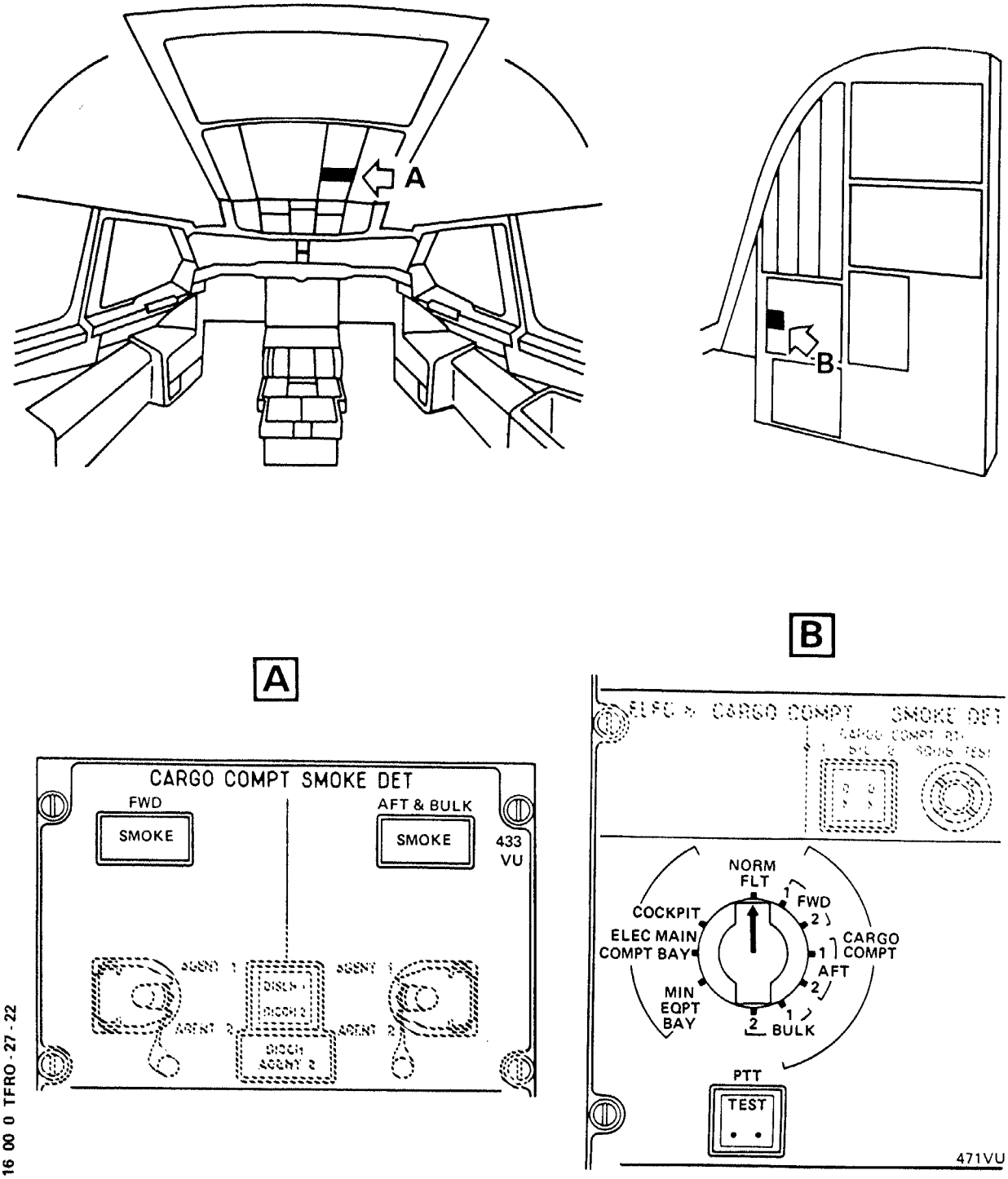
AIR COND Synoptic on the R ECAM Display Unit
Figure 003

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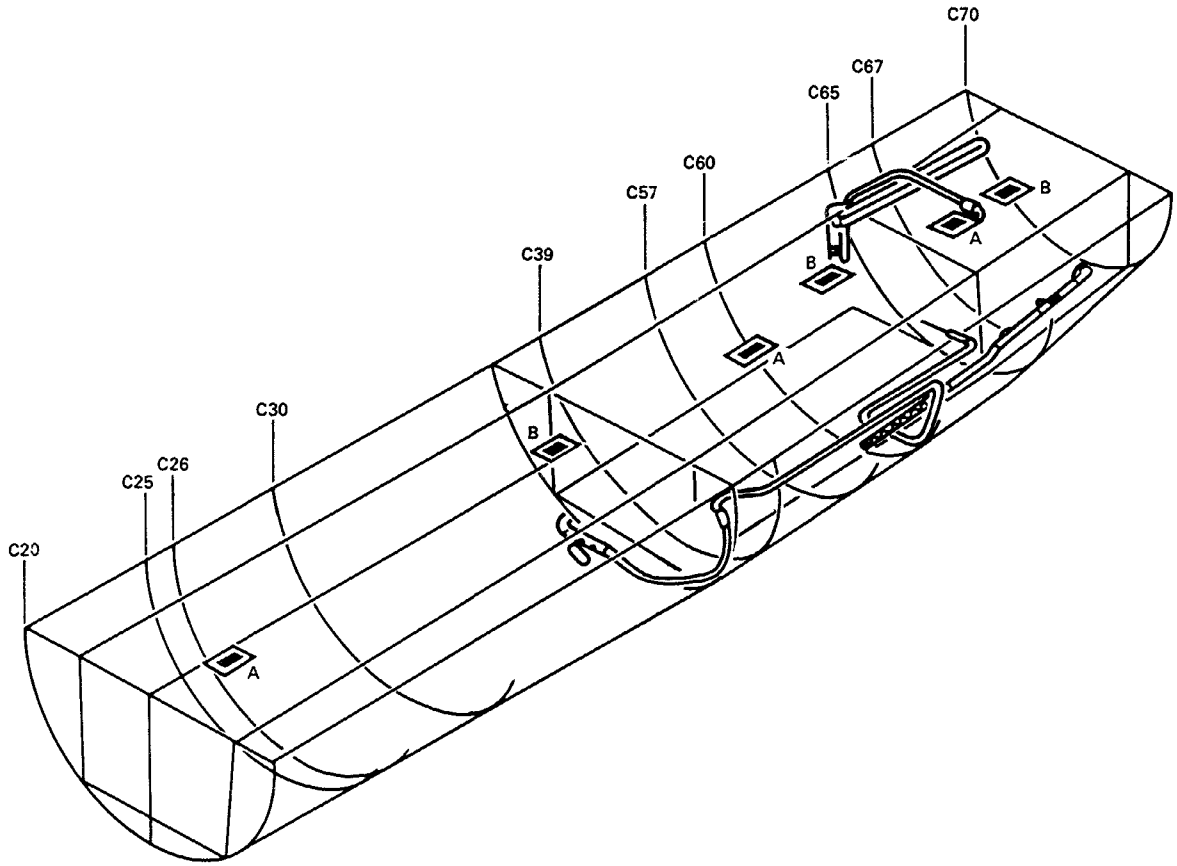
Cargo Compartment Smoke Detection - Panels - Location
Figure 004

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Cargo Compartment Smoke Detection - Component Location
Figure 005

3. Description (Ref. Fig. 006)

A. Principle

R (1)Ionization type smoke detectors
Detection is carried out by ambient smoke detectors which are of the ionization type with a system operating principle identical to that used for the electrical and electronics equipment.

R (2)Optical type smoke detectors
R Detection is carried out by ambient smoke detectors which are of the
R optical type. The smoke detection is based on the scattered light
R principle.
R When smoke particles are present in the optical path, some of the
R scattered lights reach the photo receiver and produce an electrical
R signal sent to the control unit which triggers smoke warnings.

B. Detection System Components (Ref. Fig. 005)

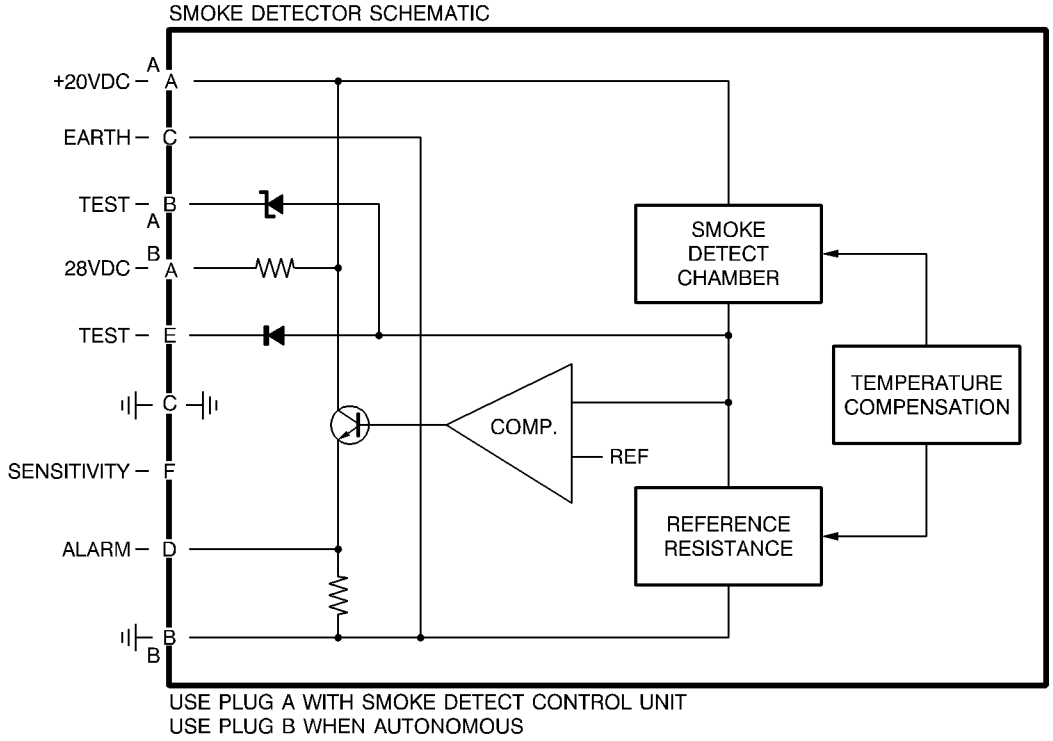
(1)Ambient smoke detectors
The ambient smoke detectors are installed in pairs in cargo compartment ceiling and localized as follows :
- two in forward cargo compartment : one forward and one aft of the compartment
- two in aft cargo compartment : one forward and one aft of the compartment
- two in bulk cargo compartment : one forward and one aft of the compartment.
In each cargo compartment, the association of one forward and one aft smoke detector composes a loop (A or B).

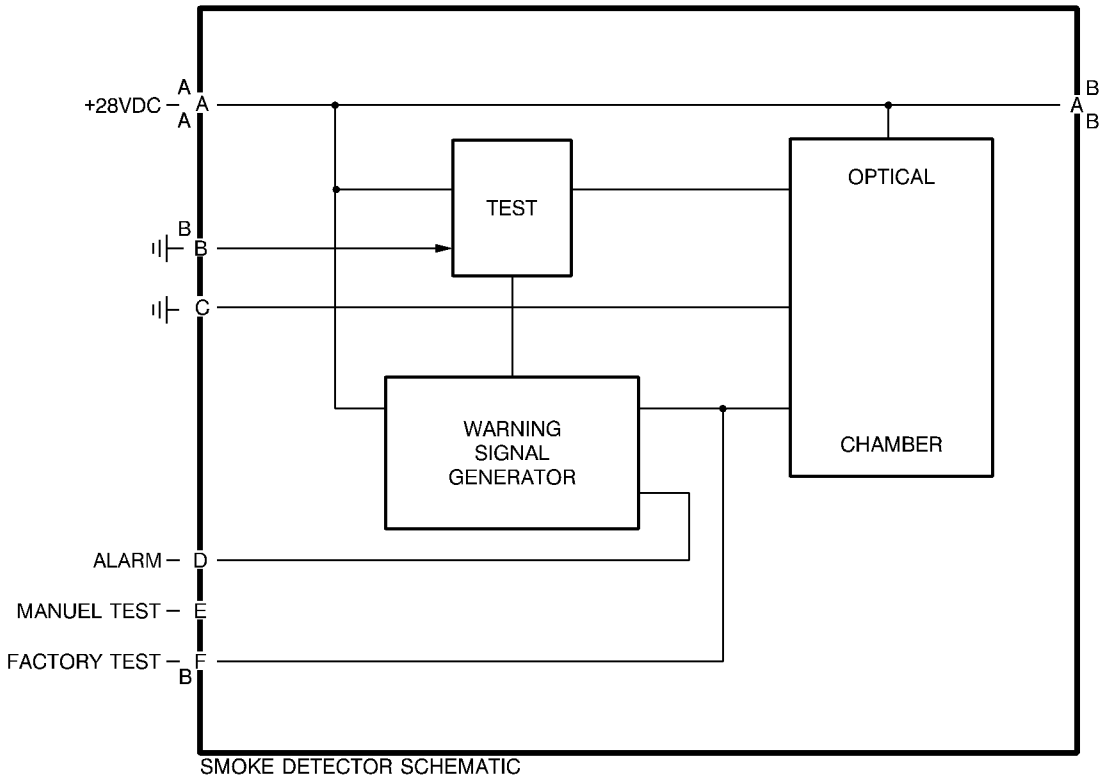
(2)Monitoring and indicating assembly
- on the overhead panel where are located two red SMOKE warning lights, FWD, AFT and BULK
- on the lateral panel, where are located
. a smoke detector test selector switch common to avionics and cargo compartment smoke detectors
. a PTT pushbutton switch enabling circuit selected by the selector switch to be tested. PTT pushbutton switch is on in any position to be tested and is off in normal flight position (NORM FLT).

4. Operation

A. Operation in Warning Configuration
(Ref. Fig. 007)
Operation of cargo compartment smoke detectors is identical to that of avionics compartment.
Detection of smoke through only one detector is sufficient to cause the corresponding cargo warning light to come on.

(1)Operation in normal (true) warning configuration
In case of smoke, the corresponding warning light comes on on the overhead panel with :
- On CAPT and F/O main instrument panels 3VU and 5VU, MASTER WARN lights flash.

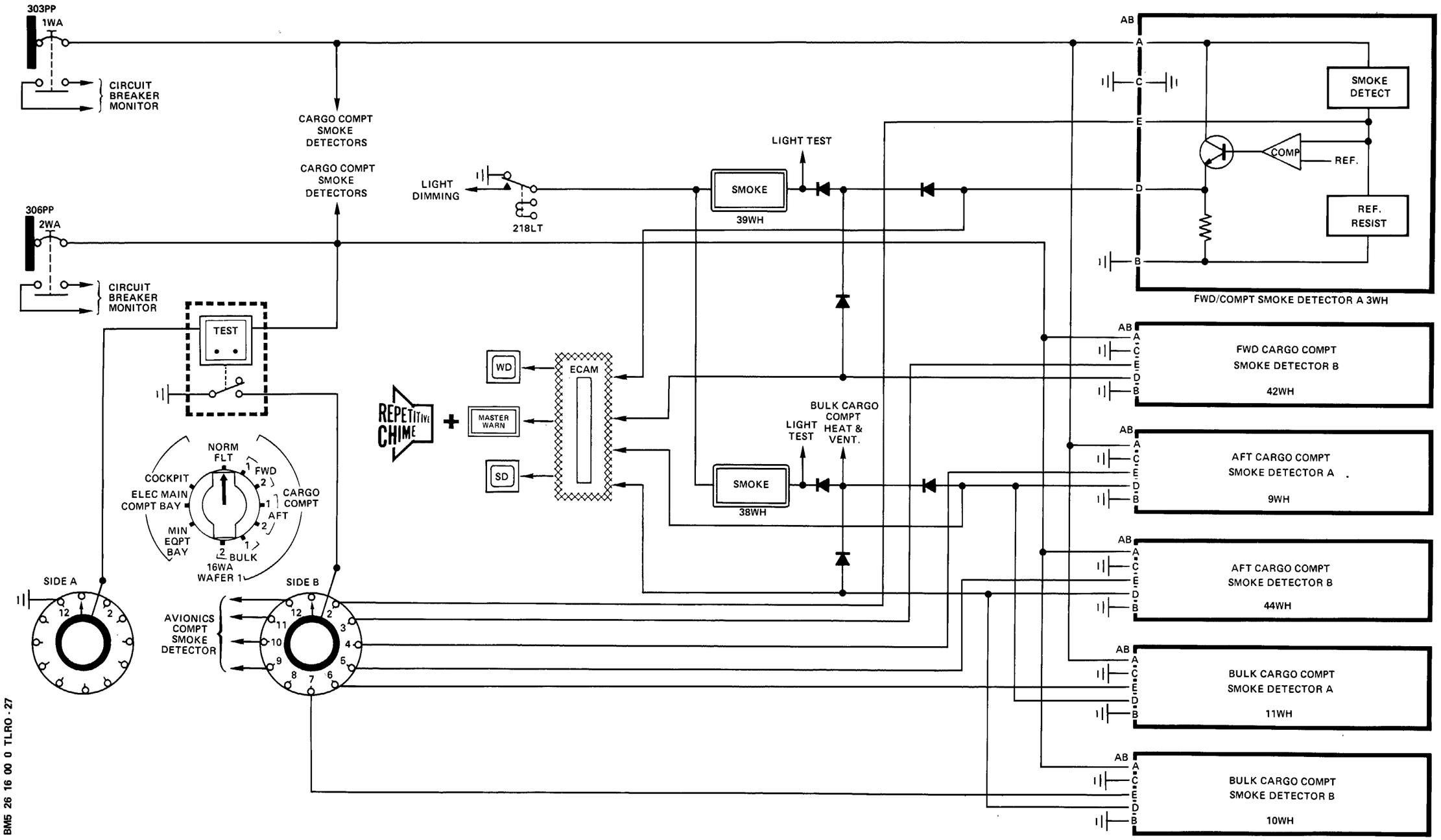



BM5 26 16 00 0 ADM0 02

Ambient Smoke Detector - Schematic
Figure 006

R

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Cargo Compartment Smoke Detection -
Electrical Circuit
Figure 007

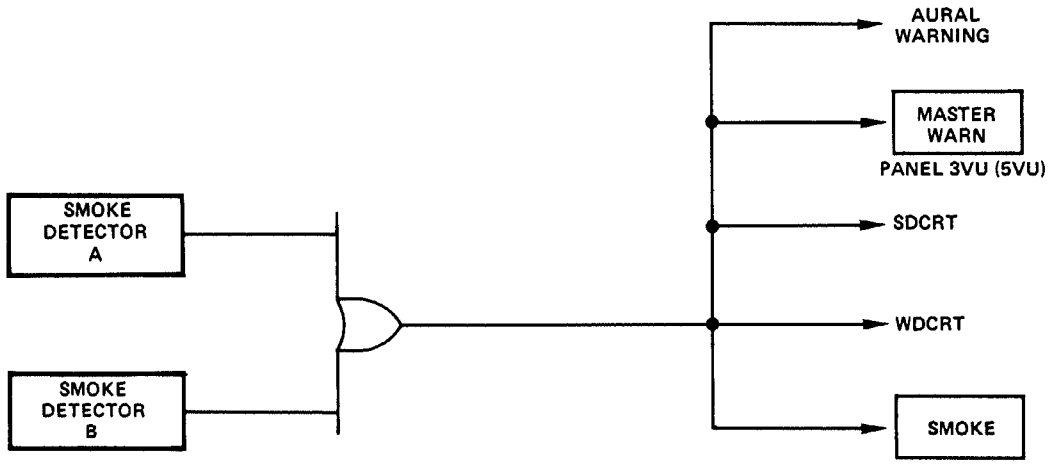
- Triggering of the repetitive chime.
- Triggering of the L ECAM display unit.
- If applicable, automatic closure of isolation and regulating valves and automatic cut off of the fan :
- In forward cargo compartment, in case of detection in this cargo compartment.
  (Ref. Fig. 008)
- In bulk cargo compartment, in case of detection in aft or bulk cargo compartment (Ref. Fig. 009, 010)

B. Operation in Test Configuration

(1) Check of SMOKE warning

Check of smoke detectors is carried out by placing the ELEC & CARGO COMPT SMOKE DET test selector switch on lateral panel in detection circuit position to be checked, then by pressing PTT pushbutton switch.
The check is correct if :

- SMOKE warning lights corresponding to the circuit to be tested come on.
- The L ECAM system with MASTER WARN lights on CAPT and F/O main instrument panels 3VU and 5VU and the repetitive chime are triggered.
- In BULK cargo compartments the ventilation and the extractor fans stop. The air conditioning block diagram appears on the R ECAM display unit.

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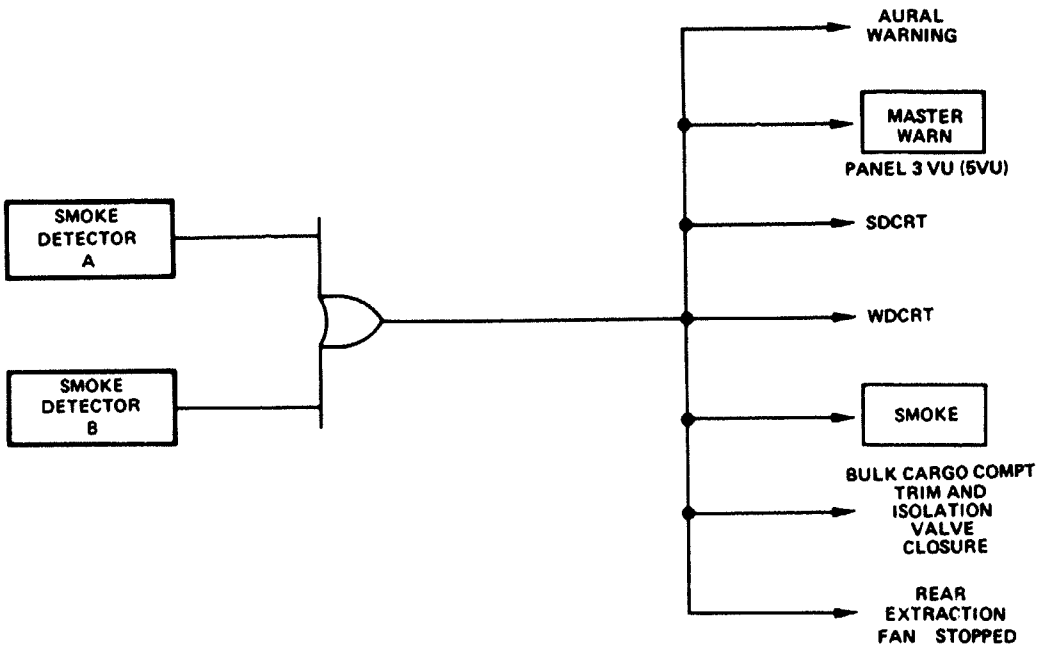
Forward Cargo Compartment Smoke Detection - Warning Logic
Figure 008

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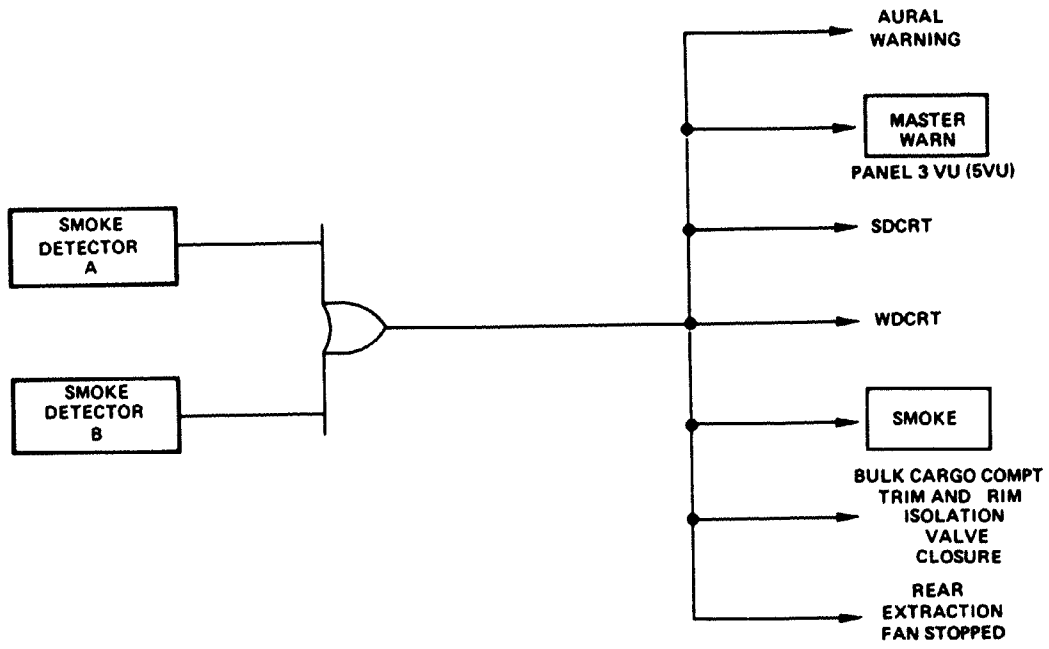
Aft Cargo Compartment Smoke Detection - Warning Logic
Figure 009

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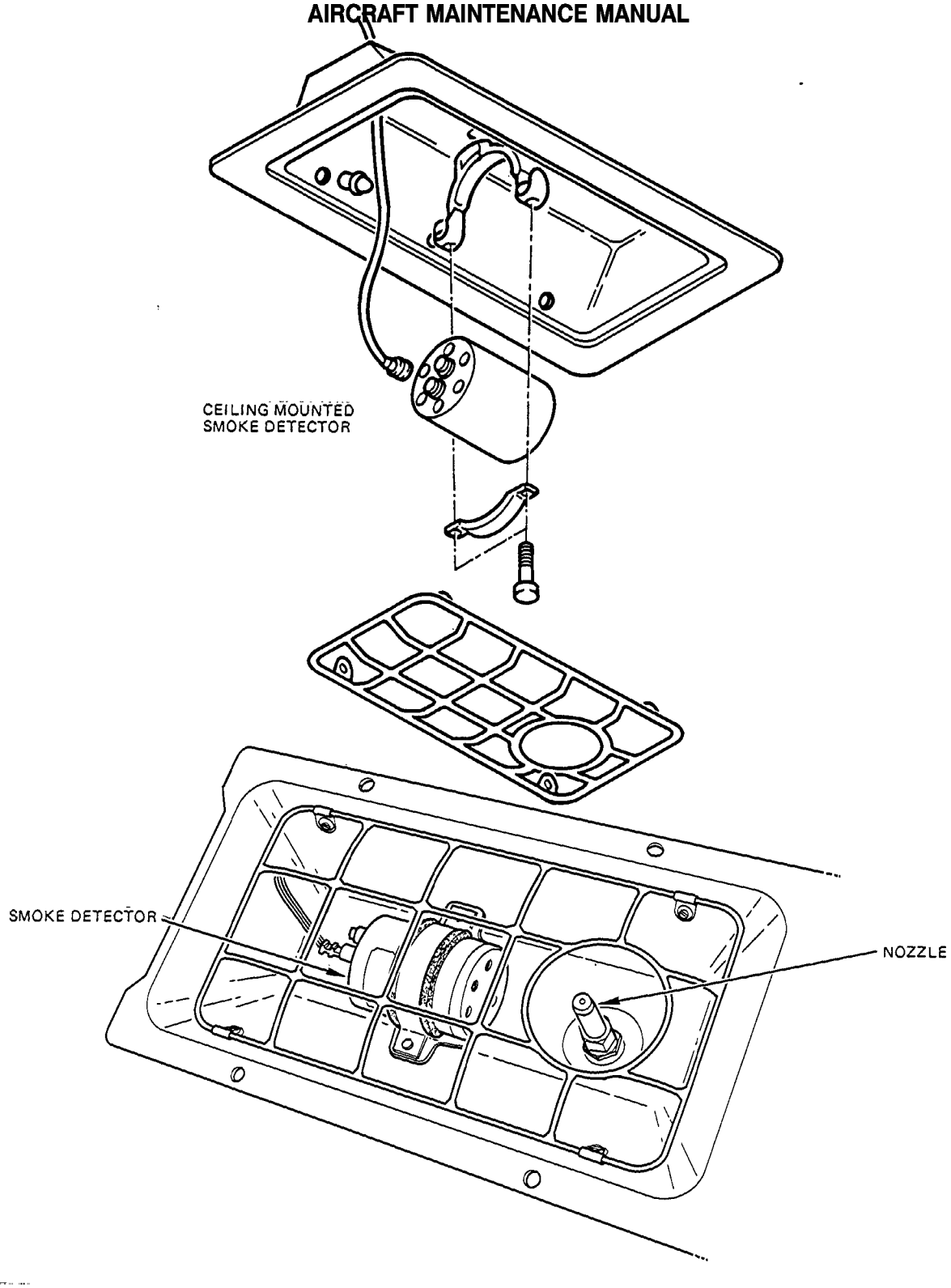
Bulk Cargo Compartment Smoke Detection - Warning Logic
Figure 010

# CARGO COMPARTMENT SMOKE DETECTION - DESCRIPTION/OPERATION

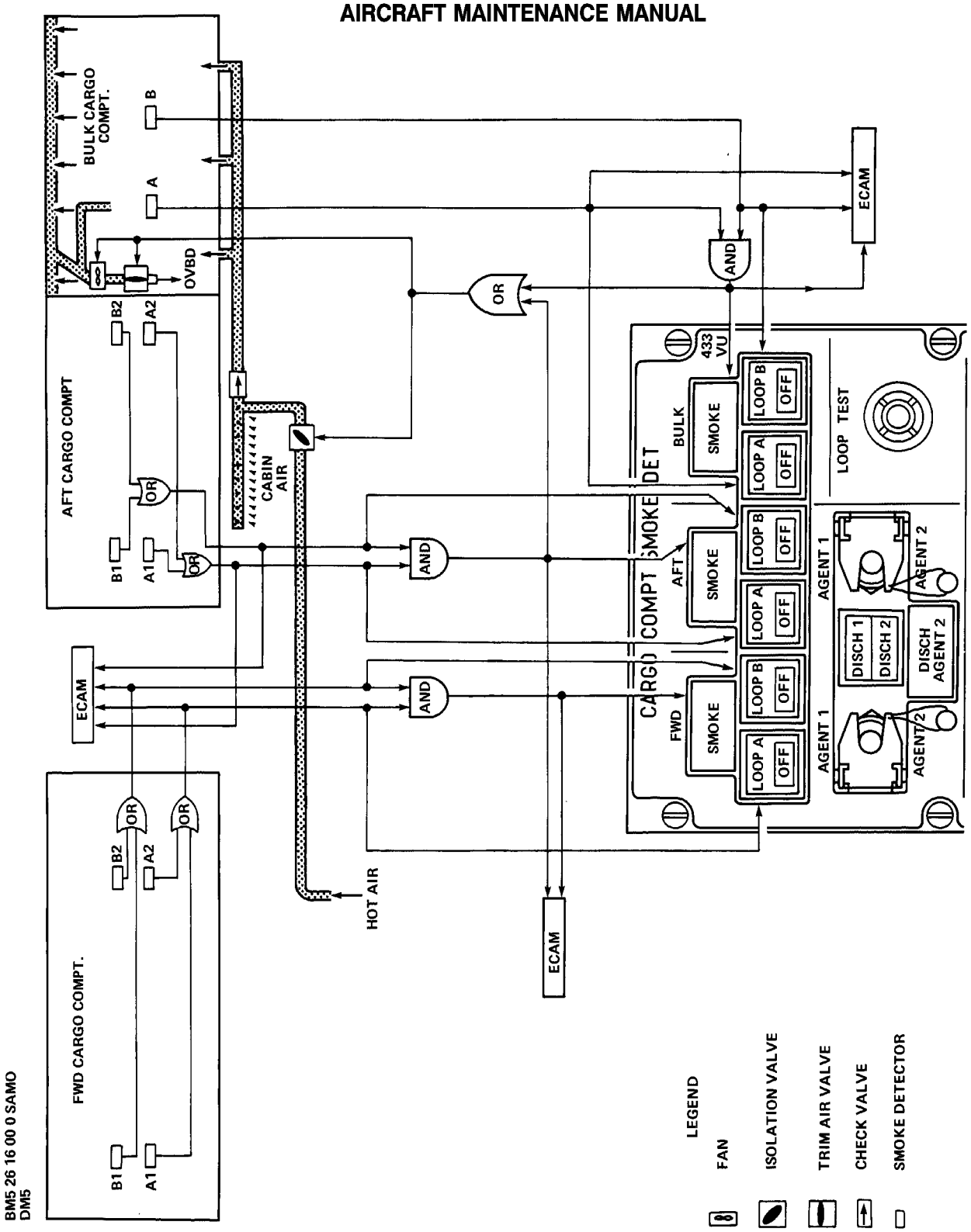
1. General (Ref. Fig. 001)
   The cargo compartment smoke detection system consists of :
   - ionisation smoke detectors installed in cargo compartment ceiling (Ref. Fig. 001)
   - one smoke detection control unit which takes into account **AND/OR** logics according to detector connection.
   - one indicating monitoring and testing assembly (Ref. Fig. 002, 003) :
     . to show warnings
     . to check detection and monitoring circuits
     . to show closure of bulk cargo compartment ventilation

2. Component Location
   (Ref. Fig. 004)
   (Ref. Fig. 007, 005)

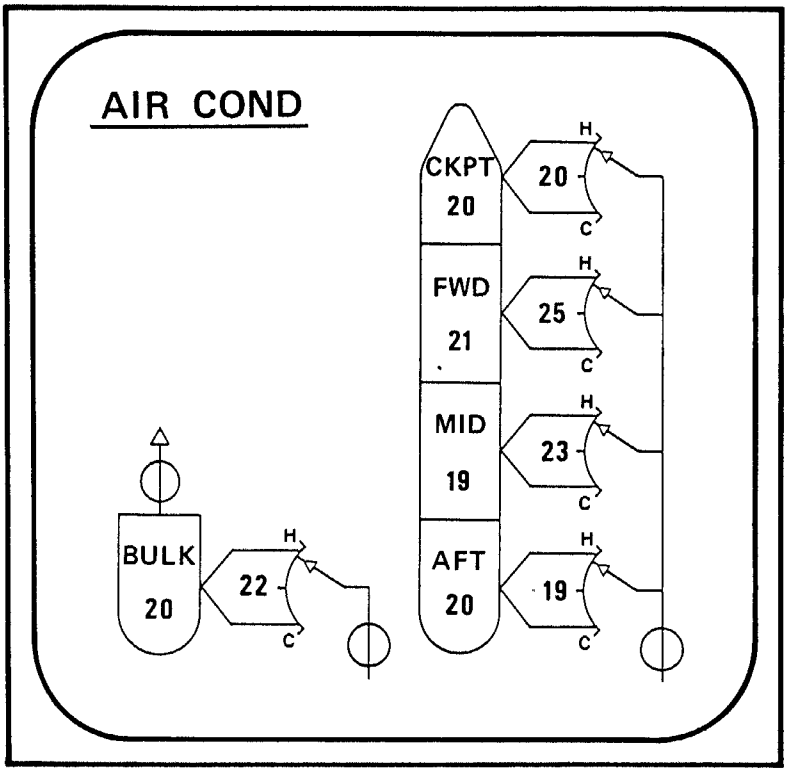
| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 3WH | DET - COMPT SMOKE, FWD CARGO | | 131 | | 26-16-11 |
| 4WH | DET - COMPT SMOKE, FWD CARGO | | 132 | | 26-16-11 |
| 8WH | DET - COMPT SMOKE, AFT CARGO | | 152 | | 26-16-11 |
| 9WH | DET - COMPT SMOKE, AFT CARGO | | 151 | | 26-16-11 |
| 10WH | DET - COMPT SMOKE, BULK CARGO | | 151 | | 26-16-11 |
| 11WH | DET - COMPT SMOKE, BULK CARGO | | 151 | | 26-16-11 |
| 42WH | DET - COMPT SMOKE, FWD CARGO | | 132 | | 26-16-11 |
| 43WH | DET - COMPT SMOKE, FWD CARGO | | 131 | | 26-16-11 |
| 44WH | DET - COMPT SMOKE, AFT CARGO | | 152 | | 26-16-11 |
| 45WH | DET - COMPT SMOKE, AFT CARGO | | 151 | | 26-16-11 |
| 18WH | CTL UNIT - CARGO SMOKE DET | 96VU | 122 | | 26-16-12 |
| 21WH | P/BSW - FWD CARGO/LOOP A/OFF | 433VU | 211 | | 26-16-00 |
| 22WH | P/BSW - FWD CARGO/LOOP B/OFF | 433VU | 211 | | 26-16-00 |
| 23WH | P/BSW - AFT CARGO/LOOP A/OFF | 433VU | 211 | | 26-16-00 |
| 24WH | P/BSW - AFT CARGO/LOOP B/OFF | 433VU | 211 | | 26-16-00 |
| 25WH | P/BSW - BULK CARGO/LOOP A/OFF | 433VU | 211 | | 26-16-00 |
| 26WH | P/BSW - BULK CARGO/LOOP B/OFF | 433VU | 211 | | 26-16-00 |
| 30WH | P/BSW - LOOP TEST | 433VU | 211 | | 26-16-00 |
| 48WH | SWITCH - CARGO COMPT LOOP TEST SEL | 471VU | 212 | | 26-16-00 |
| 16WA | SWITCH - SMOKE DET TEST SEL | 471VU | 212 | | 26-16-00 |
| 52WA | P/BSW - PTT | 471VU | 212 | | 26-16-00 |




Ceiling Mounted Smoke Detector
Figure 001




Cargo Compartment Smoke Detection - Schematic
Figure 002

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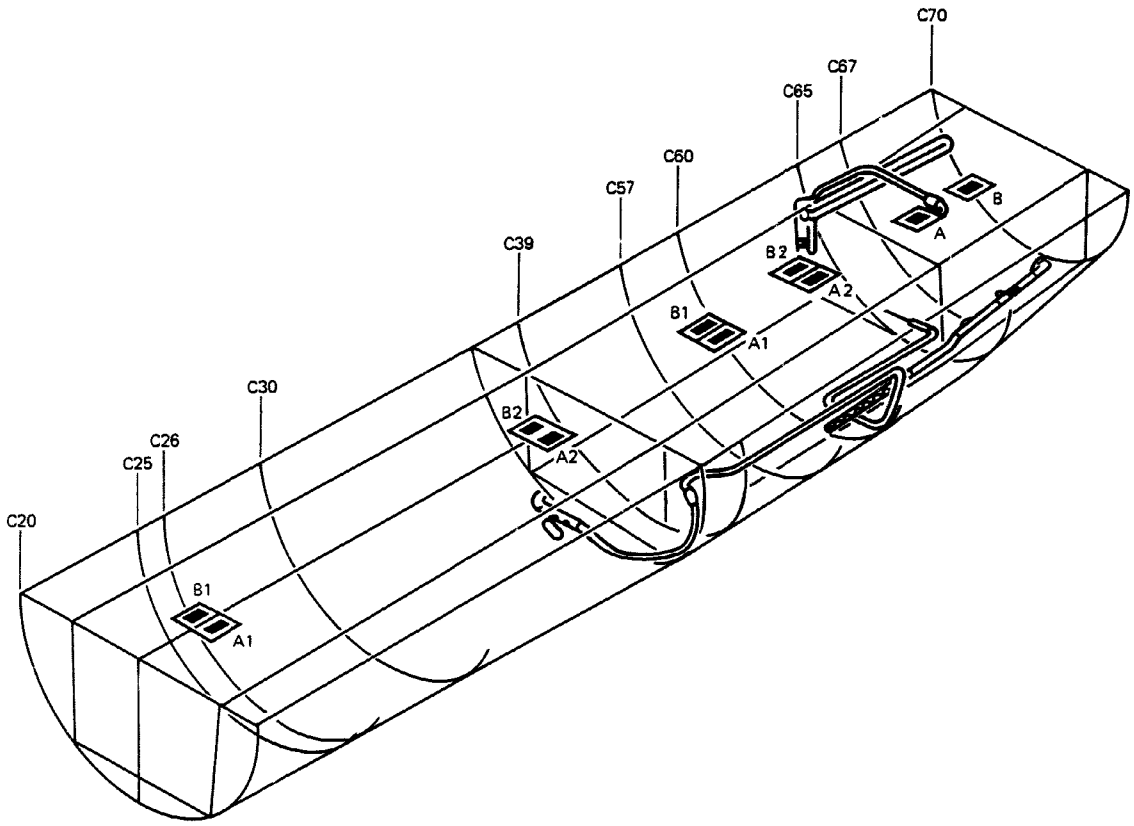
AIR COND Synoptic on the R ECAM Display Unit
Figure 003

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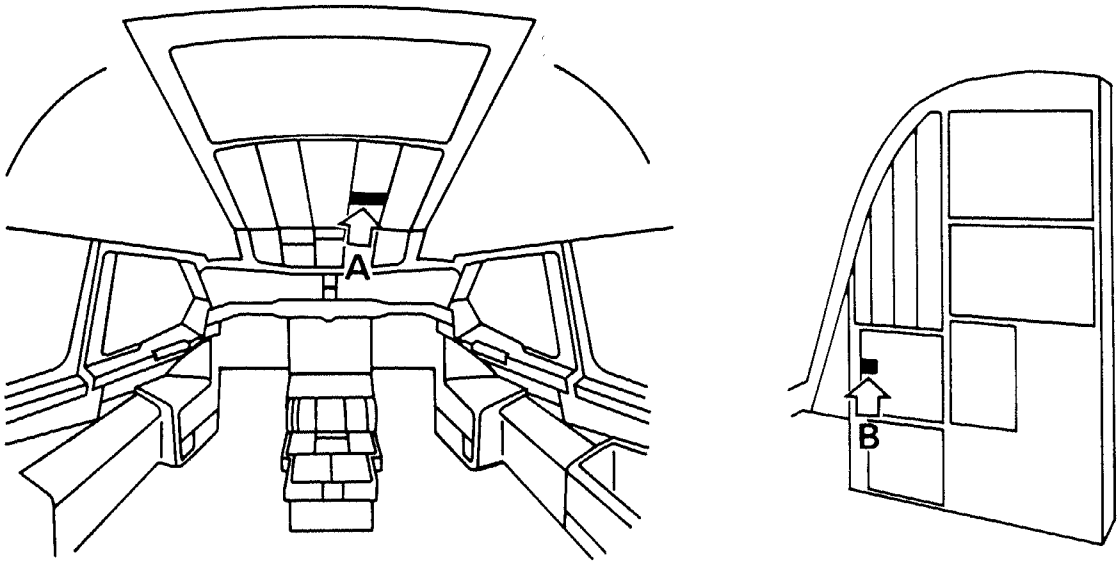
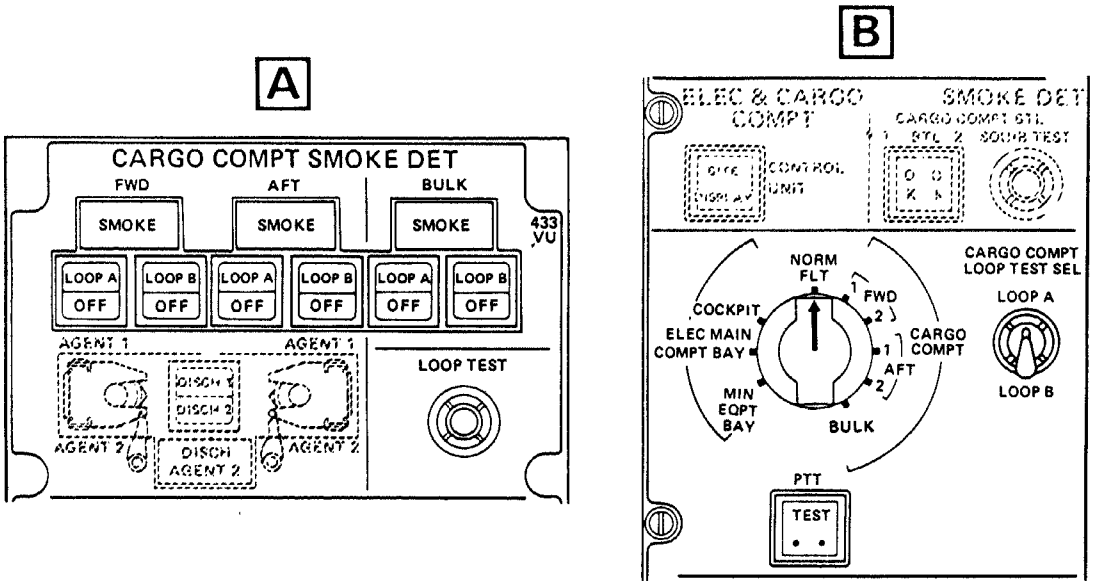
Cargo Compartment Smoke Detection - Component Location
Figure 004

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Cargo Compartment Smoke Detection - Panels - Component Location
Figure 005

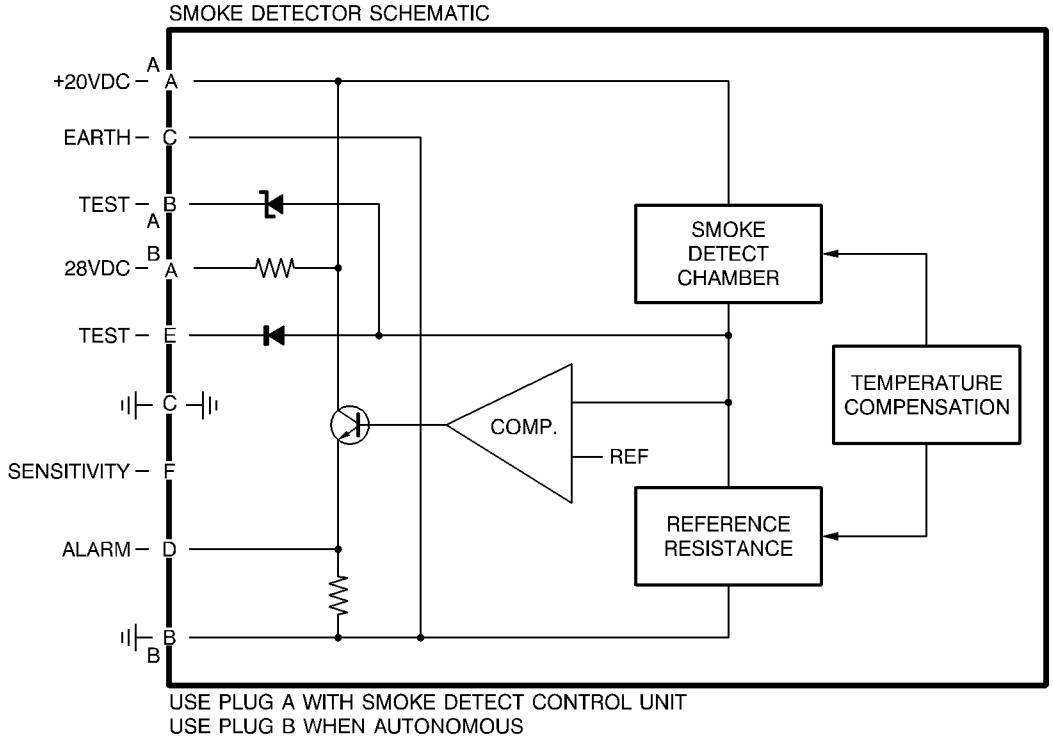
3. Description

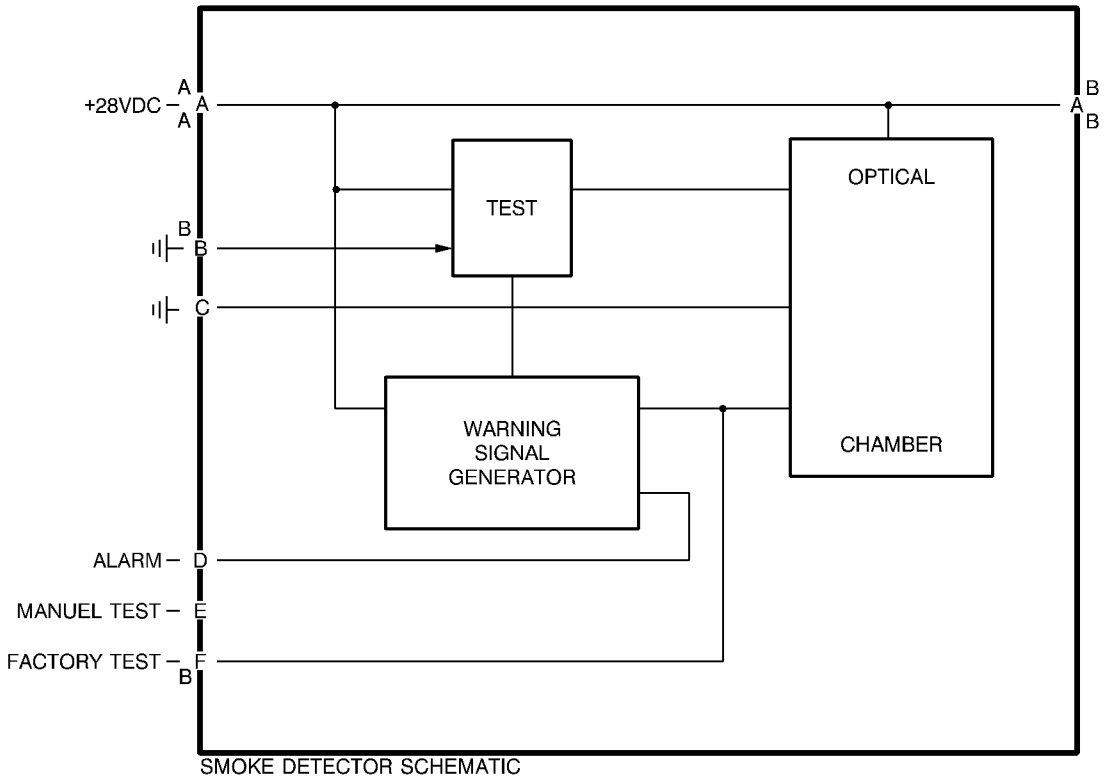
A. Principle (Ref. Fig. 006)
Detection is carried out by ambient smoke detectors which are of the ionisation type with a system operating principle identical to that used for the electrical and electronics equipment (Ref. Fig. 006)
When the reference threshold in the measurement chamber is exceeded, the detector inner electronic circuit sends a signal to the control unit which triggers smoke warnings.
The smoke detection control unit has also the same functions and moreover sends a signal to close cargo compartment ventilation heating (if installed). In this case the air conditioning synoptic appears on the R ECAM display unit (Ref. Fig. 003).

B. Detection system Components (Ref. Fig. 004, 007, 008)
(1)Ambient smoke detectors
The ambient smoke detectors are installed in pairs in cargo compartment ceiling and localized as follows :
- four in forward cargo compartment : two forward and two aft of the compartment
- four in aft cargo compartment : two forward and two aft of the compartment
- two in bulk cargo compartment : one forward and one aft of the compartment.

In each cargo compartment, the association of one forward and one aft smoke detector composes a loop (A or B).
(2)Smoke detection control unit
A ten-channel control unit is located in rack 90VU. It is common to the ten smoke detectors of the cargo compartments.
The face of the smoke detection control unit carries : (Ref. Fig. 008)
- eleven annunciator lights indicating any failure in any smoke detector circuitry or in the control unit supply
- one TEST pushbutton switch for light testing
- one RESET pushbutton switch for system resetting in case a fault is indicated by ELEC & CARGO COMPT SMOKE DET/CONTROL UNIT annunciator on lateral maintenance panel.

The smoke detection control unit is located in the avionics compartment, RH electronics rack, shelf 96VU (Ref. Fig. 007)
(3)Monitoring and indicating assembly
on the overhead panel where are located three red SMOKE warning lights, six LOOP/OFF pushbutton switches corresponding to the four smoke detectors of the FWD cargo compartment, the four smoke detectors of the aft cargo compartment and the two smoke detectors of the bulk cargo cargo and one LOOP TEST pushbutton switch enabling electrical continuity of smoke detectors and associated circuitry to be tested.
- on the lateral panel, where are located
  . one ELEC & CARGO COMPT SMOKE DET/CONTROL UNIT annunciator indicating any fault in the operation of the electronic assembly
  . a ten-position smoke detector test selector switch common to avionics and cargo compartment smoke detectors
  . a PTT pushbutton switch enabling circuit selected by the test

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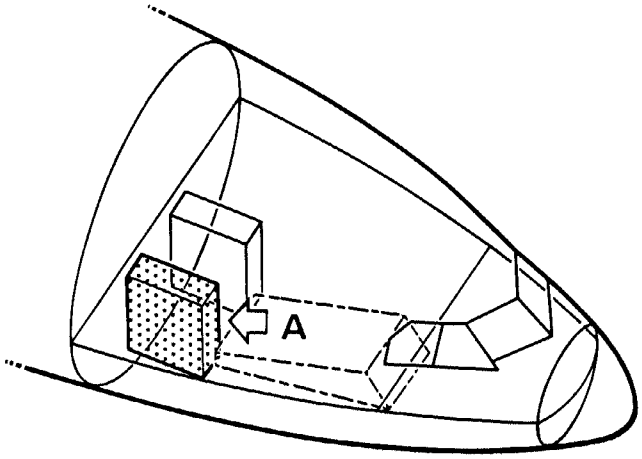
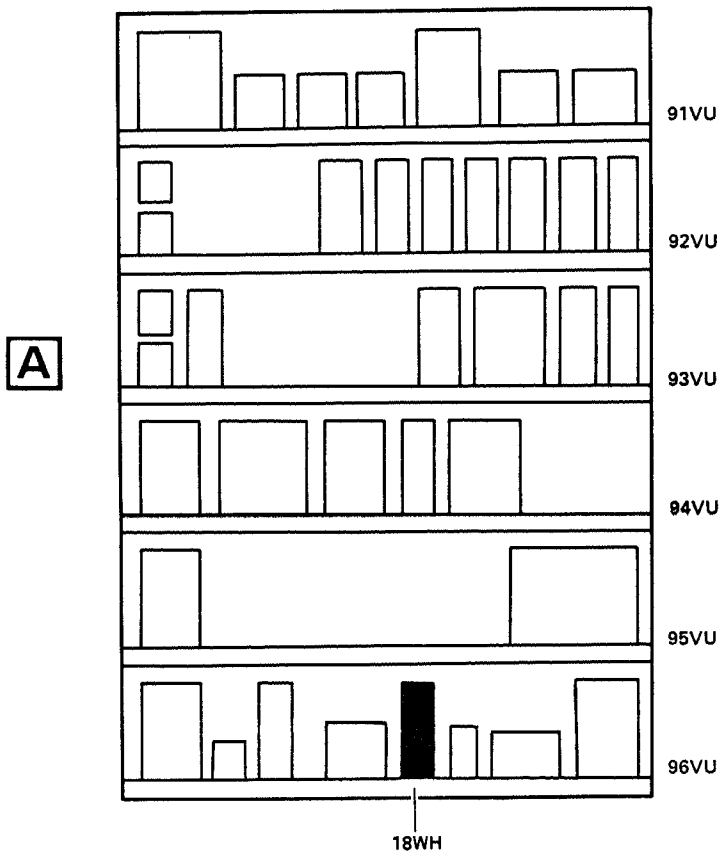
Ambient Smoke Detector - Schematic
Figure 006

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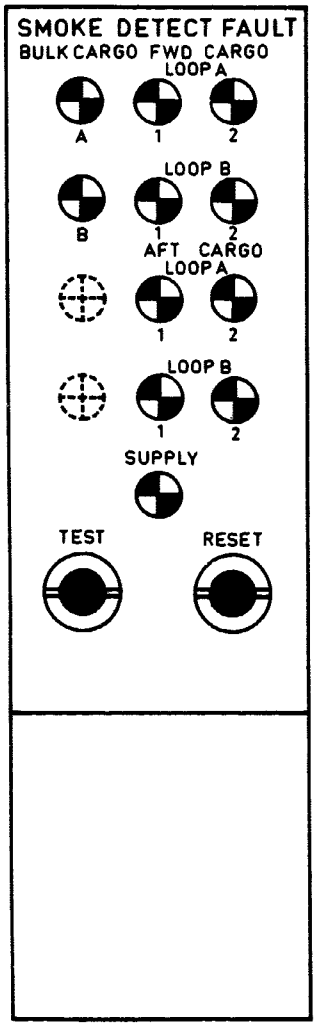
Cargo Smoke Detection Control Unit - Location
Figure 007




FACE OF CARGO SMOKE DETECTION CONTROL UNIT (WH)

CARD ASSIGNMENT

No 1 : BULK CARGO - LOOP B
2 : FWD CARGO - LOOP A 1
3 : FWD CARGO - LOOP A 2
4 : BULK CARGO - LOOP A
5 : FWD CARGO - LOOP B 1
6 : FWD CARGO - LOOP B 2
7 : AFT CARGO - LOOP A 1
8 : AFT CARGO - LOOP A 2
9 : AFT CARGO - LOOP B 1
10 : AFT CARGO - LOOP B 2
11 :
12 :

REAR CONNECTOR DPX2MA.45P.45P.34B 00 09

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Cargo Smoke Detection Control Unit - Face
Figure 008

selector switch to be tested. PTT pushbutton switch is on in any position to be tested and is off in normal flight position (NORM FLT).

. a LOOP selector switch (LOOP A or B).

4. Operation

A. Operation in Warning Configuration
(Ref. Fig. 009, 013, 014)
(Ref. Fig. 015)
(Ref. Fig. 010)
(Ref. Fig. 011)
(Ref. Fig. 012)

Operation of cargo compartment smoke detectors is identical to that of avionics compartment. Risks of spurious SMOKE warnings due to a faulty operation of one smoke detector are avoided due to the fact that both detectors (one in each loop) must detect simultaneously to trigger the SMOKE warning. When only one smoke detector senses smoke, only LOOP warning light of the corresponding loop is triggered.

(1)Operation in normal (true) warning configuration.
(Ref. Fig. 016, 017, 018)

In normal operation, CARGO COMPT SMOKE DET/LOOP A and LOOP B pushbutton switches are pressed in and extinguished. If there is smoke, smoke detector A triggers LOOP A warning light, smoke detector B triggers LOOP B and illumination of both triggers SMOKE warning light on the overhead panel with :

- on CAPT and F/O main instrument panels 3VU and 5VU, MASTER WARN warning Lights come on.
- triggering of the repetitive chime
- triggering of the R ECAM display unit (system display) and L ECAM display unit (warning display)
- if applicable, automatic closure of isolation and regulating valves and automatic cut off of the fan :
- in forward cargo compartment, in case of detection in this cargo compartment
- in bulk cargo compartment, in case of detection in aft or bulk cargo compartment

In this configuration the fire extinguisher bottles must be fired.

(2)LOOP warning configuration

In case only one LOOP warning light comes on on the overhead panel (LOOP A for example) with MASTER CAUTION warning light coming on CAPT and F/O main instrument panels 3VU and 5VU without illumination of SMOKE warning light, there are two possibilities :

- either a spurious detection by one of the smoke detectors of a same loop (A1 or A2)
- or a true detection by one of the smoke detectors of one loop without detection of one smoke detector of the other loop (B1 or B2).

Confirmation of one of the two possibilites is obtained by pressing the corresponding OFF switch to release it. It must come on while LOOP warning light goes off. After that carry out test of the other loop (B)

- if the test indicates a correct operation, i.e. if LOOP warning light

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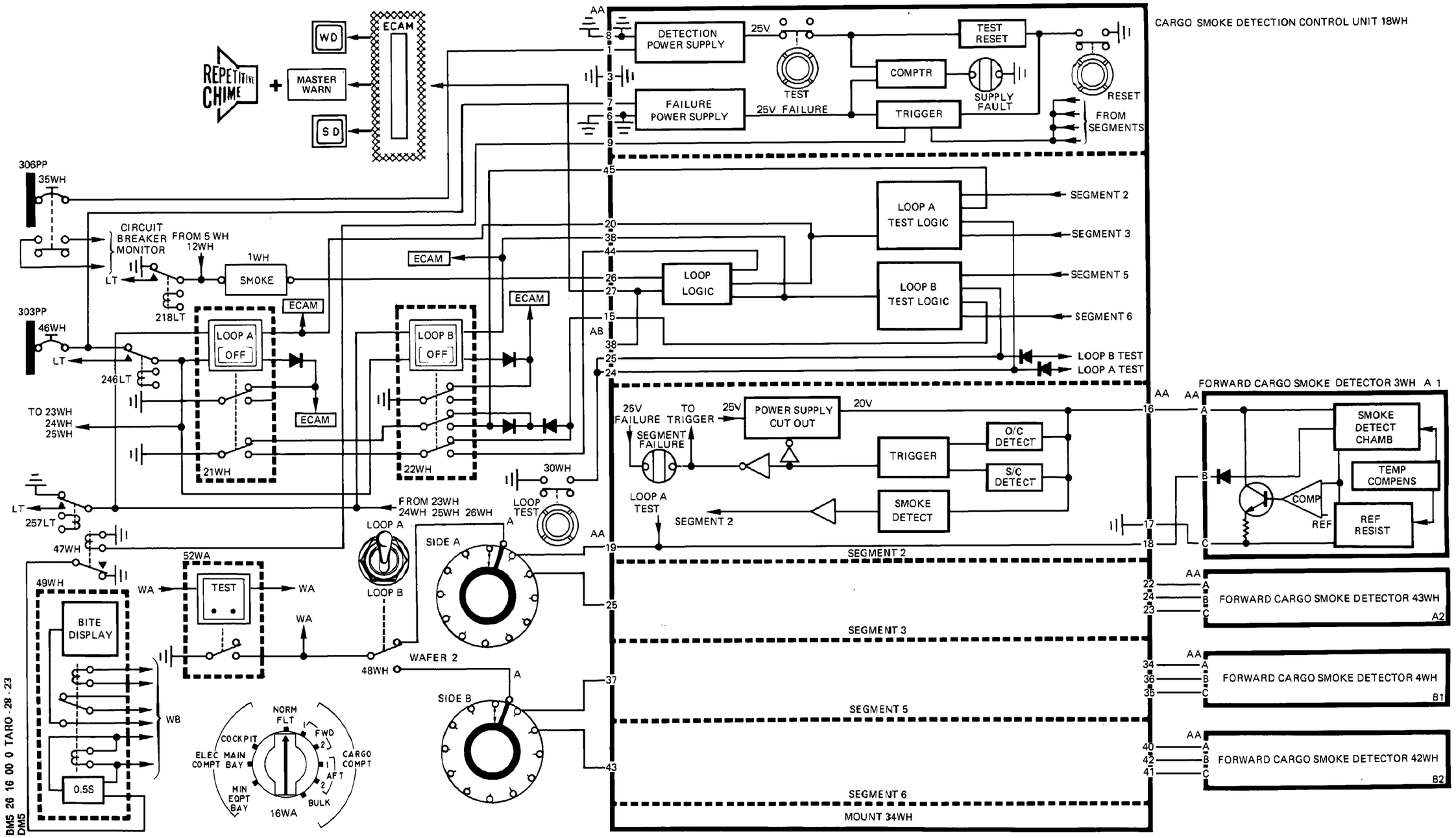
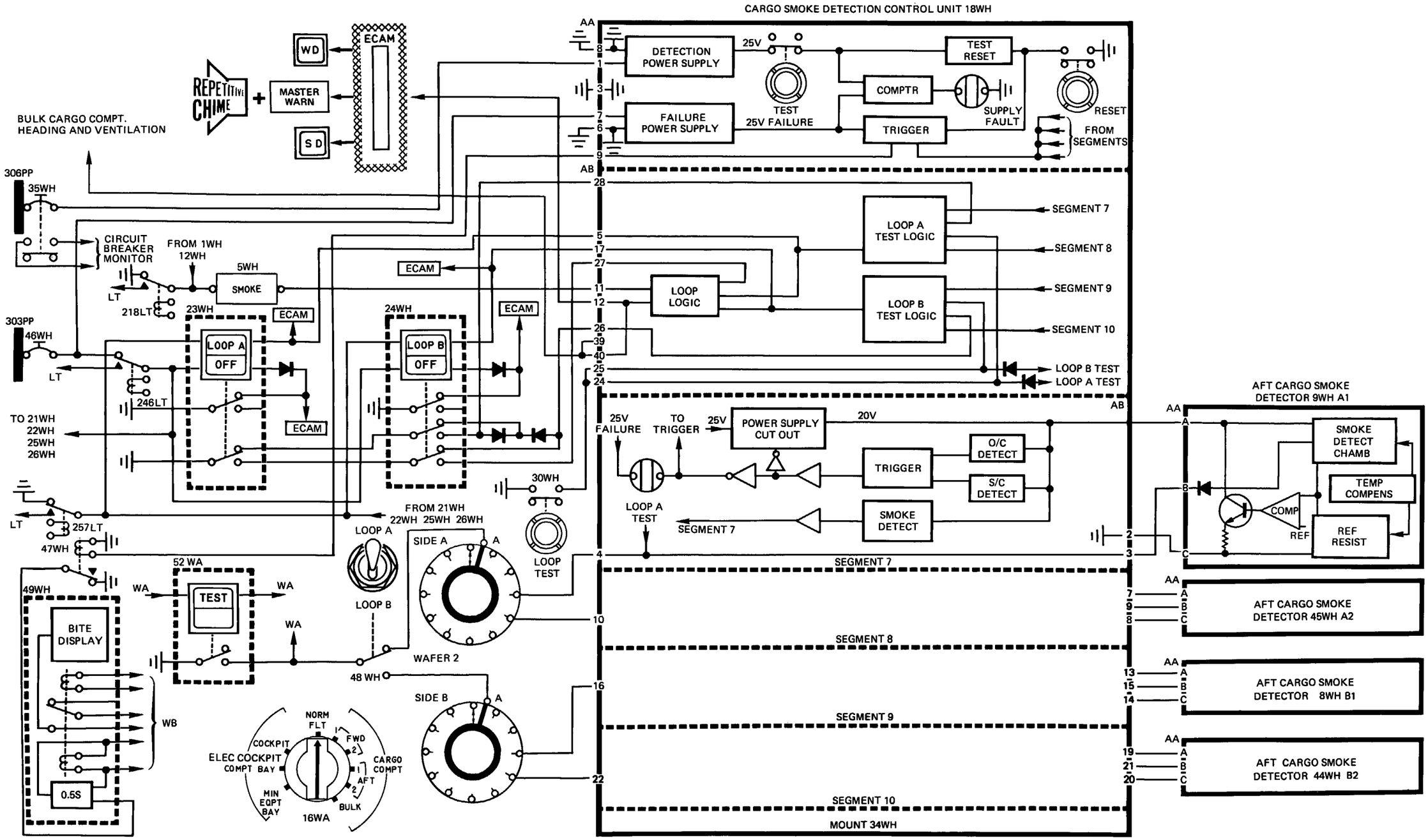



Forward Cargo Compartment Smoke Detection - Schematic
Figure 009

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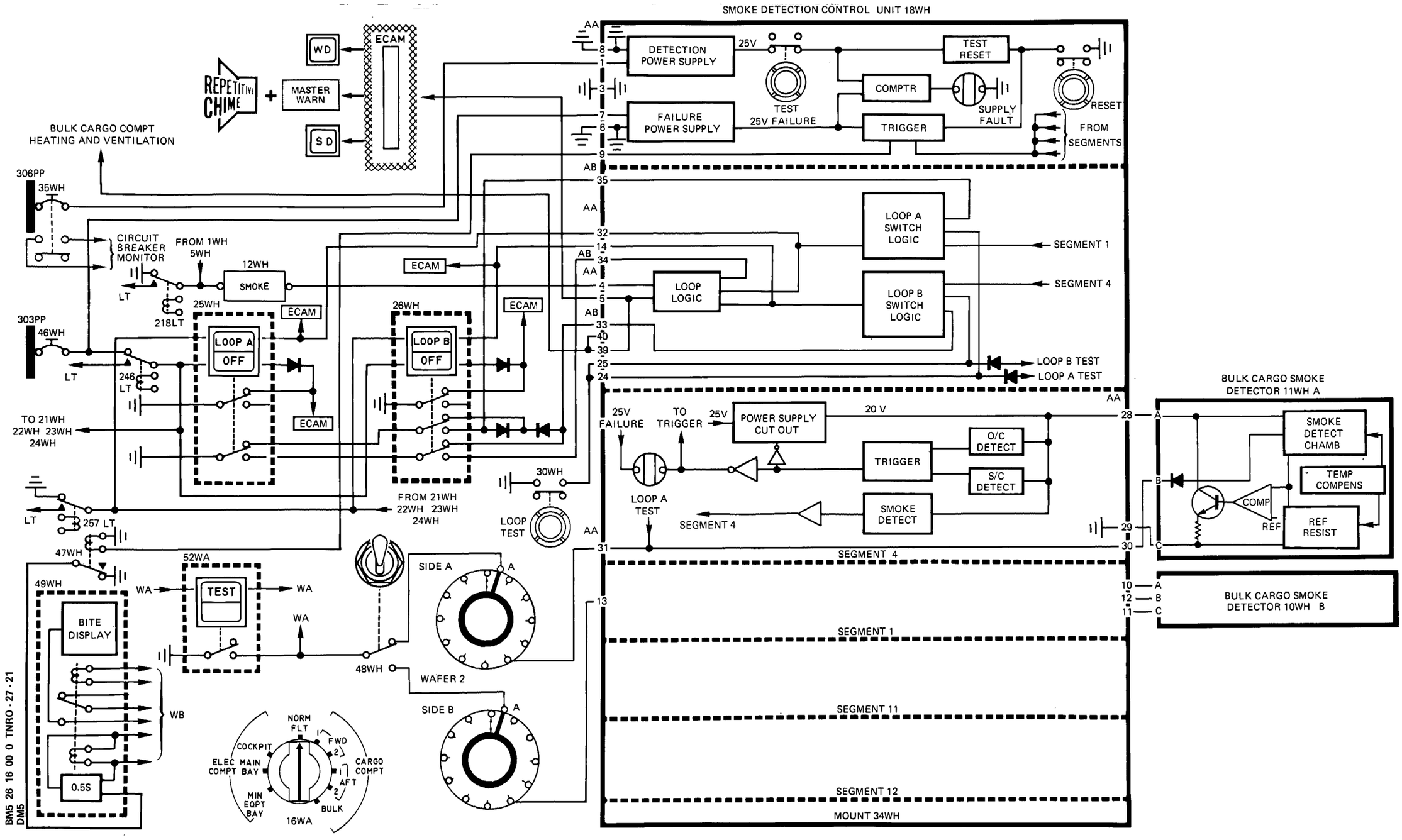
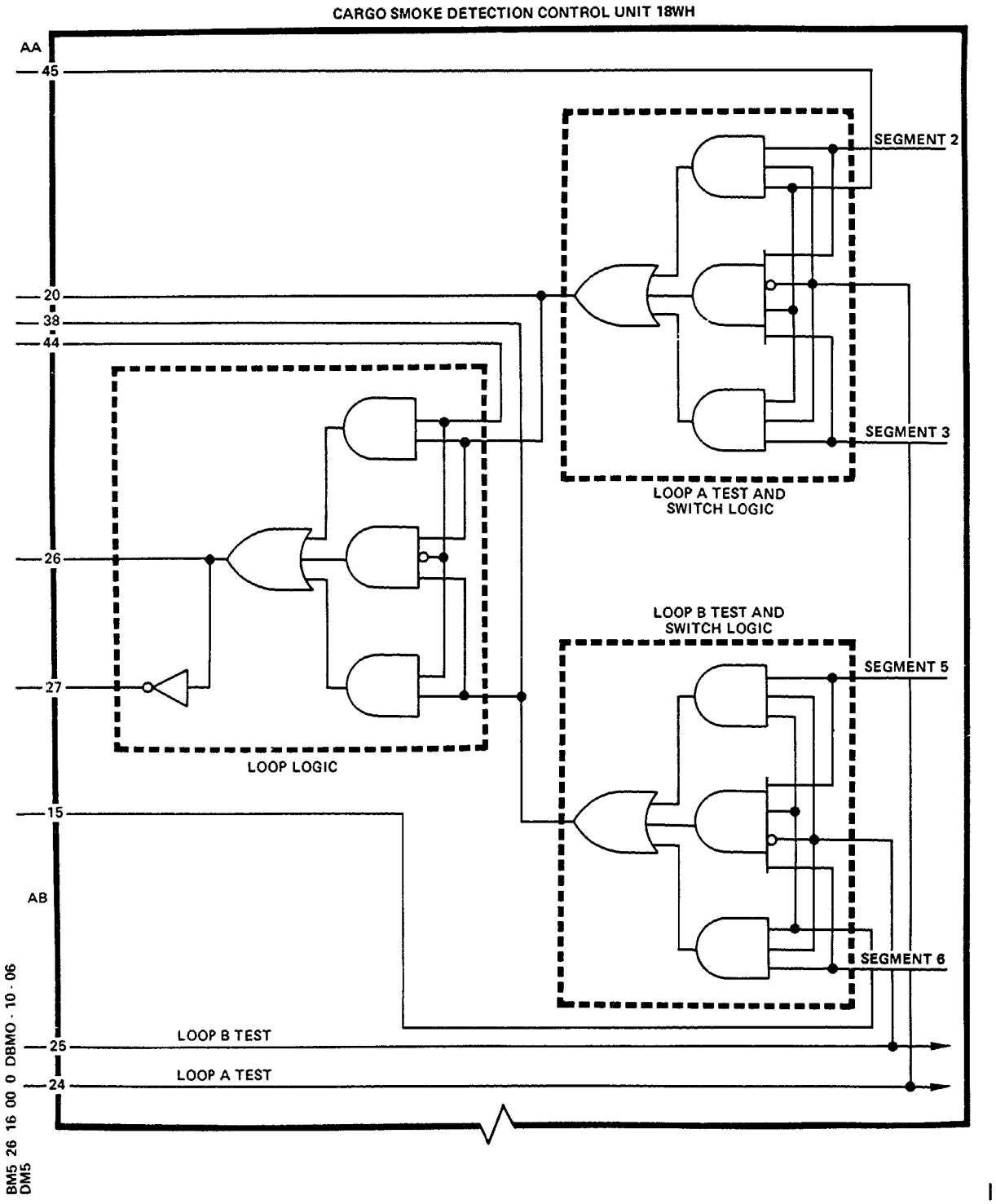
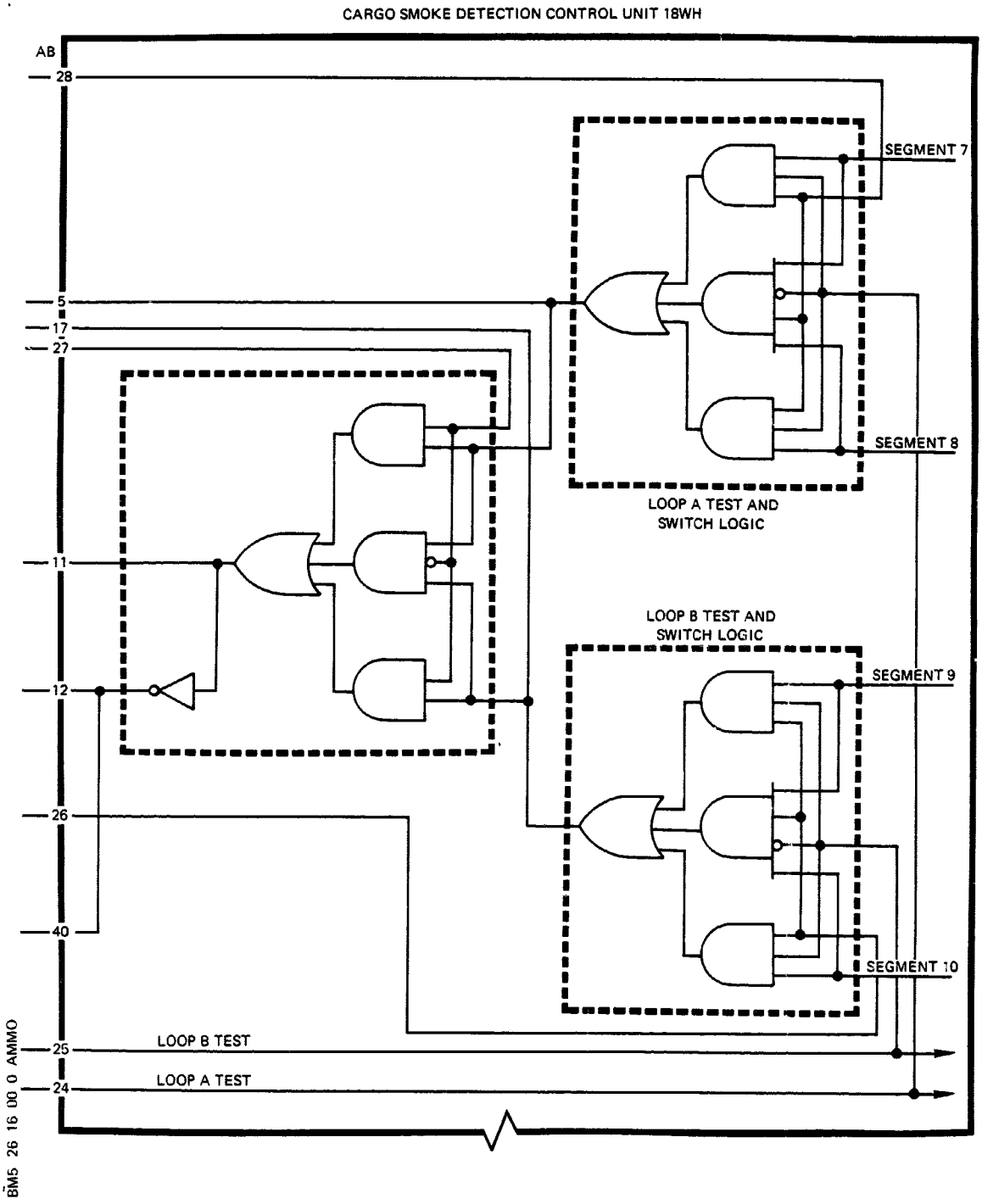
Aft Cargo Compartment Smoke Detection - Schematic
Figure 010



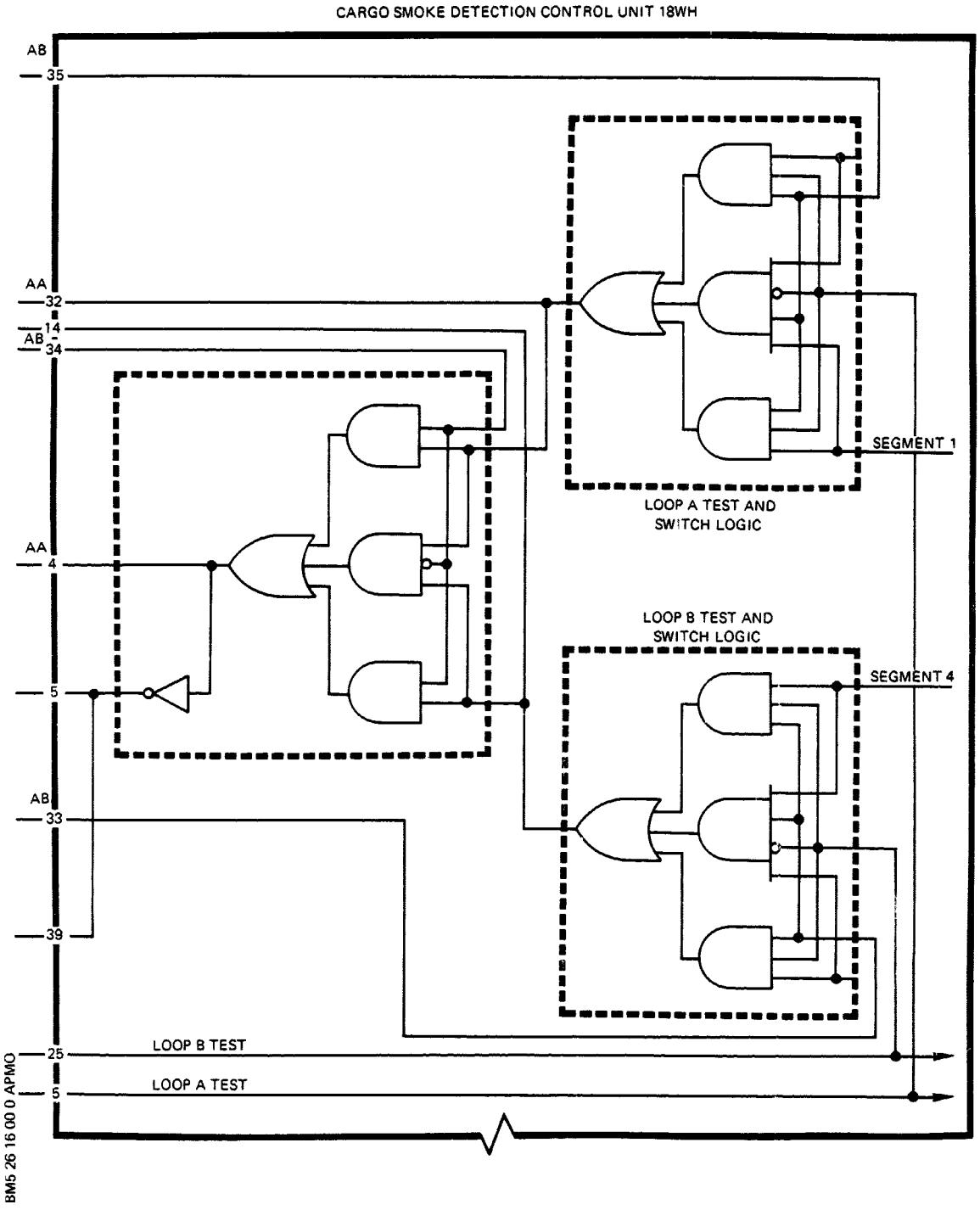

Bulk Cargo Compartment Smoke Detection - Schematic
Figure 011



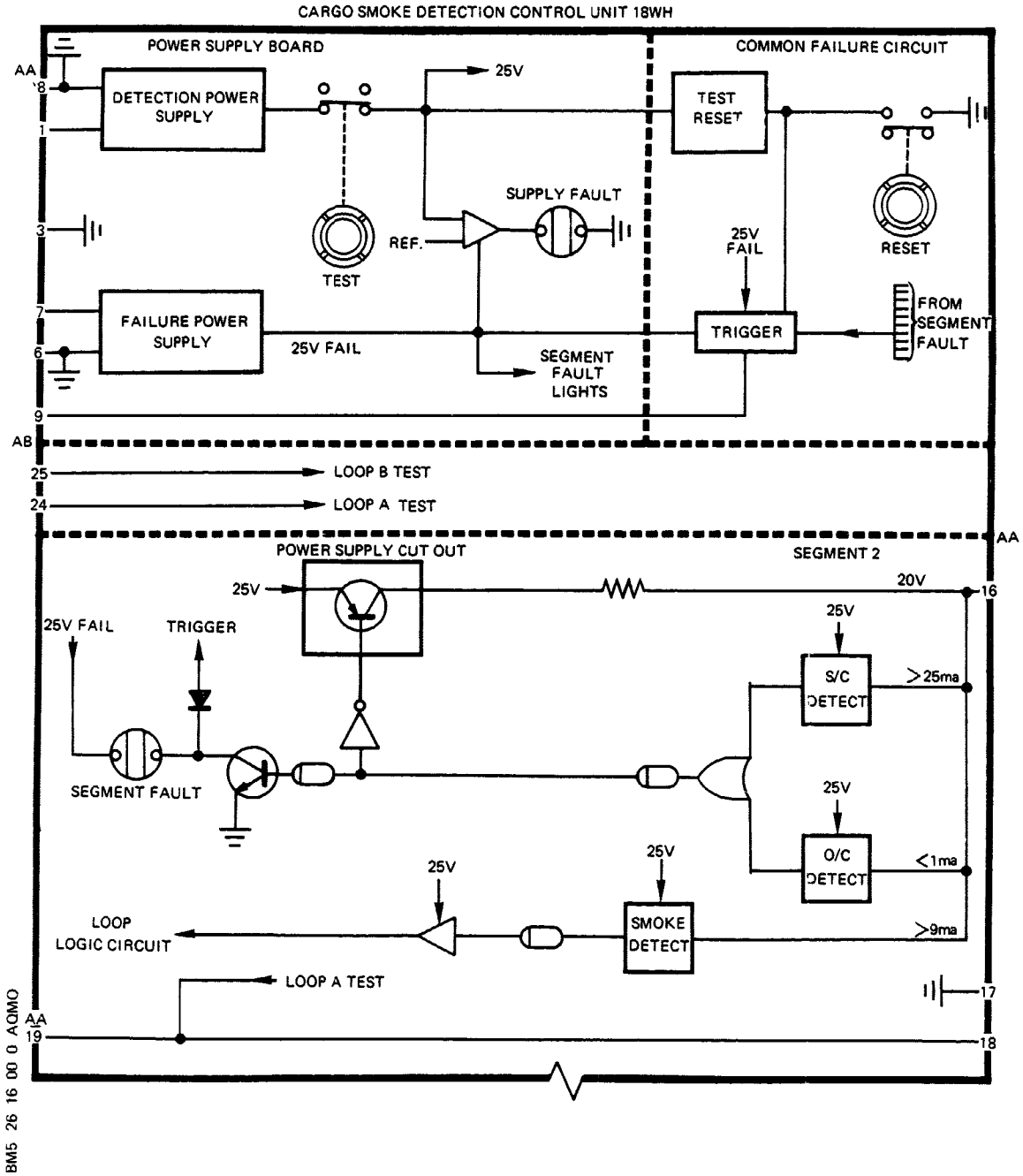

Cargo Smoke Detection Control Unit - Forward Cargo Logic
Figure 012



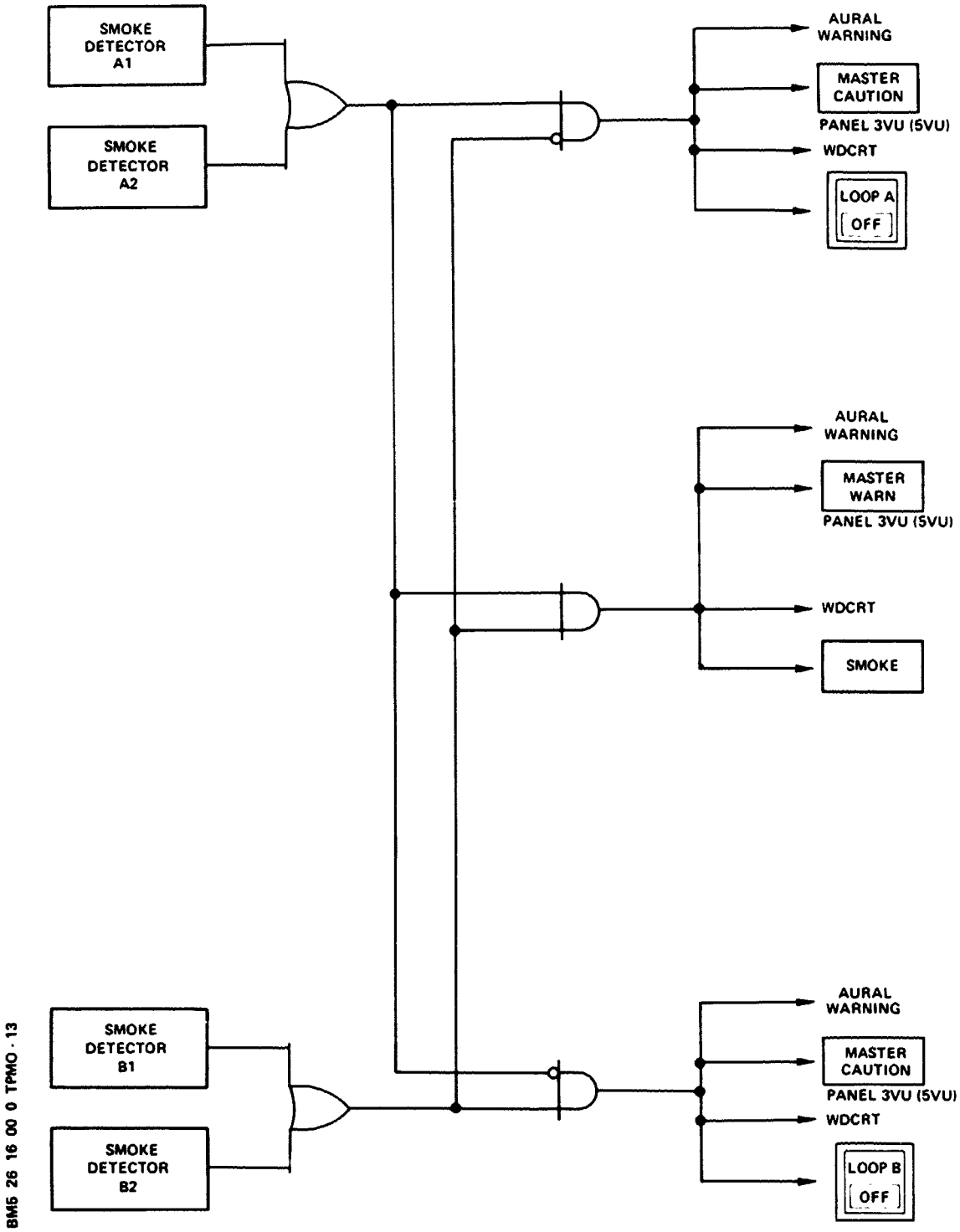

Cargo Smoke Compartment Detection Control Unit - Aft Cargo Logic
Figure 013



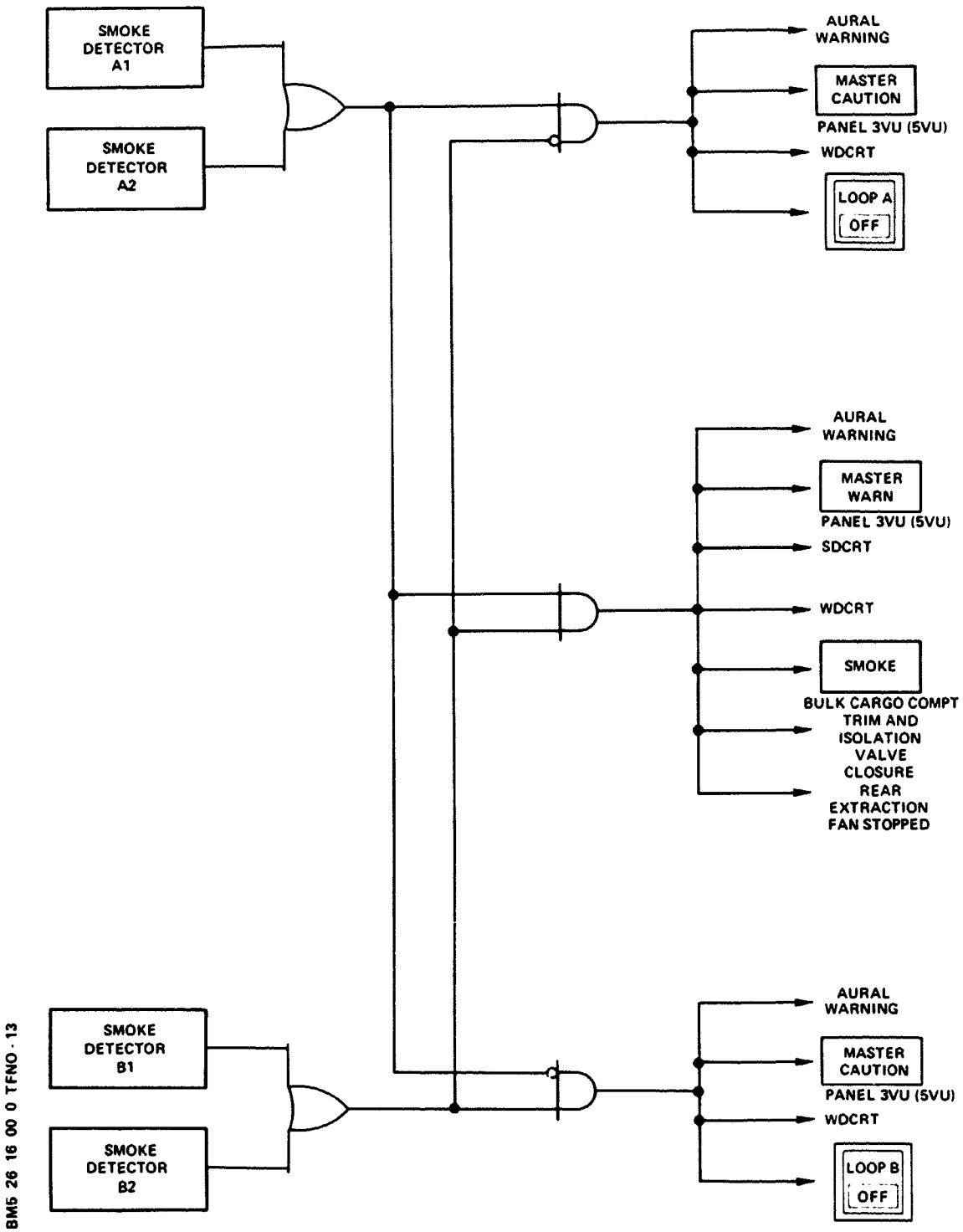

Cargo Smoke Detection Control Unit - Bulk Cargo Logic
Figure 014



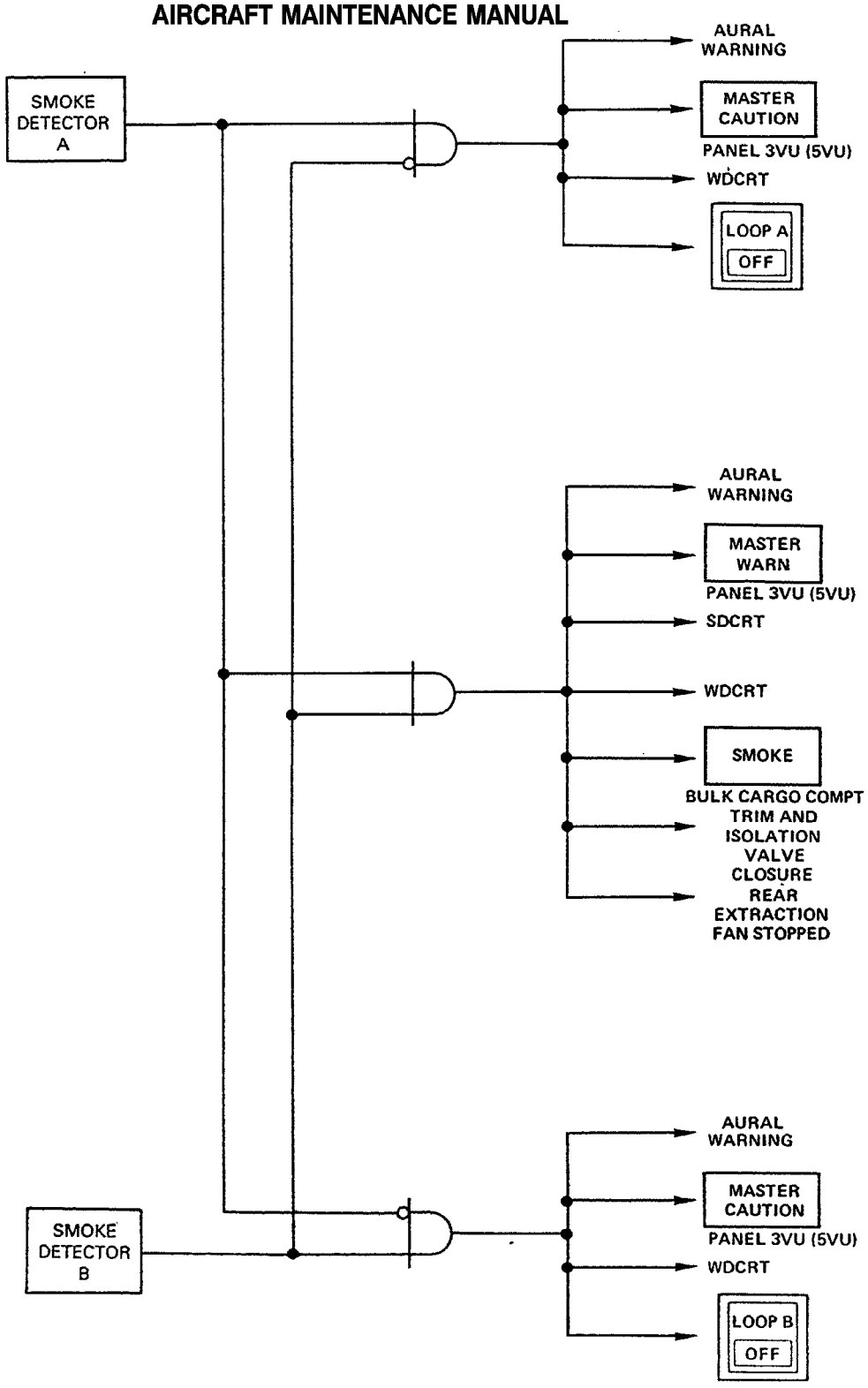

Cargo Smoke Detection Control Unit - Power Supply
Figure 015




Forward Cargo Compartment Smoke Detection - Warning Logic
Figure 016




Aft Cargo Compartment Smoke Detection - Warning Logic
Figure 017

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Bulk Cargo Compartment Smoke Detection - Warning Logic
Figure 018

of the other loop (B1 or B2) comes on, it means that smoke detectors of that loop function correctly and consequently that detection through the first loop (A1 or A2) is spurious
- if the test indicates a faulty operation, i.e. if LOOP warning light of the other loop (B1 or B2) remains off, it means that at Least one smoke detector of that loop do not function and consequently that detection through the first loop is correct : it is the case of a true warning. The faulty smoke detector will be isolated by means of the ten-position smoke detector test selector switch on the maintenance panel.

B. System Fault Indication

In the same way as for the avionics compartment detection system, when a fault occurs on one of the detection circuits :
- BITE DISPLAY legend comes on on RH lateral ELEC & CARGO COMPT SMOKE DET maintenance panel to indicate a fault
- the warning light corresponding to that circuit and located on the face of smoke detection control unit comes on. The faulty circuit is isolated by pressing RESET pushbutton. This circuit will no longer operate until the fault is repaired.

After resetting :
- BITE DISPLAY legend goes off thus indicating that the monitoring circuits are rearmed
- the warning light on the face of the smoke detection control unit remains on, electrically latched.

NOTE : In case of fault, actions will be taken only during servicing.

C. Operation in Test Configuration

(1)Check of SMOKE warning

(a)System test

On CARGO COMPT SMOKE DET panel, press the 6 LOOP pushbutton switches :
- press LOOP TEST pushbutton switch
  LOOP A
  LOOP B
  SMOKE (panel)
  SMOKE (MW)
  are triggered but there is no LOOP warning on the master warning
- the detection function on the pressed in position of LOOP A pushbutton switch and released out position of LOOP B pushbutton switch (or inversely) is not tested.

NOTE : After this test, it is necessary to select OFF/R on COMPT TEMP/ISOL VALVE pushbutton switch for BULK cargo compartment air conditioning resetting.

(b)Maintenance test

1 After a test with negative result, a spurious warning or a non detection, the faulty detector will be isolated by means of the switches

2 Check of the control unit-to-MW LOOP by testing each detector with the selector switches

3 Check of the detection function on one LOOP A or B and of MW SMOKE connection select A channel for FWD cargo compartment detection

(**LOOP A** pushbutton switch pressed in and **LOOP B** pushbutton switch released out) and press **LOOP TEST** pushbutton switch.
**LOOP A**
**SMOKE** (panel)
**SMOKE (NM)**
are triggered for the **FWD** cargo compartment
**LOOP A**
**LOOP B**
**SMOKE** (panel)
**SMOKE (MW)**
are triggered for the **AFT** and **BULK** cargo compartments.
Select **B** channel for the **FWD** cargo compartment detection (**LOOP A** released out and **LOOP B** pressed in) and press **LOOP TEST** pushbutton switch.
**LOOP B**
**SMOKE** (panel)
**SMOKE (MW)**
are triggered for the **FWD** cargo compartment.
**LOOP A**
**LOOP B**
**SMOKE** (panel)
**SMOKE (MW)**
are triggered for the **AFT** and **BULK** cargo compartments.
Loop inhibition can thus be checked for **FWD** cargo compartment detection.
Apply the same procedure for **AFT** and **BULK** cargo compartments.
NOTE 1 : Testing of each detector is carried out by means of the ten-position selector switch and **LOOP A/LOOP B** switch.
For example : with switch in **LOOP A** position and selector switch in **FWD 1** position, detector **A1** is tested.

## 1. Operational Test

A. Reason for the Job

(1)To check that smoke detection system operates correctly.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedures | |
| - 21-21-00, P. Block 301 | Flight Compartment and Electronics Racks Air Distribution |
| - 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure

(1)Job set-up

(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Make certain that electronics racks ventilation system is correct (Ref. 21-21-00, P. Block 301).

(c)Make certain that the appropriate circuit breakers are closed, particularly those associated with cargo compartment smoke detection and ECAM :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AVIONICS SMOKE DET/DETECTORS | 1WA | 204/F25 |
| 22VU | AVIONICS SMOKE DET/DETECTORS | 2WA | 204/F24 |
| 21VU | ECAM/FLT WARN/MONITOR | 4WW | 108/B 6 |
| 21VU | ECAM/FWC 1 | 7WW | 108/B 8 |
| 21VU | ECAM/FWC 2 | 32WW | 109/A 8 |
| 21VU | ECAM/SDAC/PWR/SUPPLY | 6WV | 109/A 5 |
| 21VU | ECAM/CTL PNL/LT | 12WT | 108/B 1 |

R (d)On COMPT TEMP panel 437VU, make certain that ISOL VALVE
R pushbutton switch is pressed in.

(e)On COMPT TEMP panel 437VU, place COMPT/DUCT temperature selector switch in BULK CARGO position.

(f)On ECAM control panel (center pedestal) press and release COND pushbutton switch, AIR COND page appears on R ECAM display unit.

(2)Test

| ACTION | RESULT |
|---|---|
| On COMPT TEMP panel 437VU<br>- place and hold BULK CARGO temperature selector in MAN/HOT position until trim air valve has at least reached half open position. | In bulk cargo compartment<br>- trim air valve opens and remains open.<br>On R ECAM display unit<br>- BULK trim air valve position indicating pointer moves to H position. |

| ACTION | RESULT |
|---|---|
| On ELEC & CARGO COMPT SMOKE DET section of panel 471VU<br>- place smoke detector test selector switch 16WA in CARGO COMPT/FWD/1 position | On panel 471VU<br>- TEST Legend of PTT pushbutton switch comes on. |
| R - press and hold PTT pushbutton switch | On CARGO COMPT SMOKE DET section of panel 433VU<br>- CARGO COMPT SMOKE DET/FWD/SMOKE warning light comes on.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights flash<br>Repetitive chime sounds.<br>On L ECAM display unit.<br>- message starting with SMOKE appears. |
| - release PTT pushbutton switch | On CARGO COMPT SMOKE DET section of panel 433VU<br>- FWD/SMOKE warning light goes off.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights go off<br>Repetitive chime stops.<br>On L ECAM display unit<br>- last message disappears. |
| On ELEC & CARGO COMPT SMOKE DET section of panel 471VU<br><br>- Repeat actions described above, placing test selector switch successively in FWD/2, AFT/1, AFT/2, BULK/1, BULK/2 positions. | On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights flash<br>Repetitive chime sounds.<br>Other results obtained according to the position of test selector switch are shown on the table. |

R

| POSITION OF TEST SELECTOR SWITCH ON 471VU | WARNING LIGHTS CONCERNED (433VU) |
|---|---|
| CARGO COMPT/FWD/1 | FWD/SMOKE |
| CARGO COMPT/FWD/2 | FWD/SMOKE |
| CARGO COMPT/ | AFT & BULK/SMOKE |

| POSITION OF TEST SELECTOR SWITCH ON 471VU | WARNING LIGHTS CONCERNED (433VU) |
|---|---|
| AFT/1 | |
| CARGO COMPT/ AFT/2 | AFT & BULK/SMOKE |
| CARGO COMPT BULK/1 | AFT & BULK/SMOKE |
| CARGO COMPT BULK/2 | AFT & BULK/SMOKE |

D. Close-Up
(1)Place smoke detector test selector switch **16WA** in **NORM FLT** position.
(2)Place **BULK CARGO** temperature selector in **AUTO** position.
(3)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(4)Reset **ISOL VALVE** pushbutton switch.
(5)Restore system and aircraft to normal operating conditions.

R CARGO COMPARTMENT SMOKE DETECTION - ADJUSTMENT/TEST

R

1. Operational Test

A. Reason for the Job
(1)To check that smoke detection system operates correctly.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedures | |
| - 21-21-00, P. Block 301 | Flight Compartment and Electronics Racks Air Distribution |
| - 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure
(1)Job set-up
(a)Energize the aircraft electrical network (Ref.24-41-00, P. Block 301).
(b)Make certain that electronics racks ventilation is correct (Ref. 21-21-00, P. Block 301).
(c)Close overhead panel circuit breakers, particularly those associated with cargo compartment smoke detection and ECAM.

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AVIONICS SMOKE DET/DETECTORS | 1WA | 204/F25 |
| 22VU | AVIONICS SMOKE DET/DETECTORS | 2WA | 204/F24 |
| 22VU | CARGO SMOKE DET/PWR/SUPPLY | 35WH | 209/A26 |
| 22VU | CARGO SMOKE DET/WARN | 46WH | 209/A25 |
| 21VU | ECAM/FLT WARN/MONITOR | 4WW | 108/B 6 |
| 21VU | ECAM/FWC 1 | 7WW | 108/B 8 |
| 21VU | ECAM/FWC 2 | 32WW | 109/A 8 |
| 21VU | ECAM/SDAC/PWR/SUPPLY | 6WV | 109/A 5 |
| 21VU | ECAM/CTL PNL/LT | 12WT | 108/B 1 |

(d)On CARGO COMPT SMOKE DET panel 433VU, make certain that FWD/LOOP A, FWD/LOOP B, AFT/LOOP A, AFT/LOOP B, BULK/LOOP A and BULK/LOOP B are pressed in.
(e)On COMP TEMP panel 437VU, place COMPT/DUCT temperature selector switch in BULK CARGO position and make certain that ISOL VALVE pushbutton switch is pressed (in).
(f)On ECAM control panel (center pedestal)
- press and release COND pushbutton switch, AIR COND page appears on R ECAM display unit.

(2)Test (Loop test and extended loop test)
NOTE : As during the test, the response time of each detection loop is different, LOOP warnings (single chime and ECAM message) may appear during test sequence. These warnings disappear as soon as SMOKE warning (ECAM message) is activated.
For the same reason, SMOKE warnings (FWD, AFT, BULK) are not

generated simultaneously, thus causing a discontinuity of the repetitive chime due to the designed priorities of the warning controllers.
Actually, the operator must first of all take into account the positive result of the test and not the system transients which may occur during the test sequence.

| ACTION | RESULT |
|---|---|
| (a)On **COMPT TEMP** panel **437VU**<br>- place and hold **BULK CARGO** temperature selector in **MAN/HOT** position until trim air valve has reached half open position | In bulk cargo compt<br>- trim air valve opens and remains open.<br>On **R ECAM** display unit<br>- **BULK** cargo trim air valve position indicating pointer moves to **H** position. |
| R (b)On **CARGO COMPT SMOKE DET** section of panel **433VU**<br>- press and hold **LOOP TEST** pushbutton switch | On panel **433VU**<br>- **FWD/SMOKE, FWD/LOOP A, FWD/LOOP B** warning lights come on.<br>- **AFT/SMOKE, AFT/LOOP A AFT/LOOP B** warning lights come on.<br>- **BULK/SMOKE, BULK/LOOP A, BULK/LOOP B** warning lights come on.<br>On **CAPT** and **F/O** main instrument panels **3VU** and **5VU**<br>- **MASTER WARN** lights flash.<br>- repetitive chime sounds.<br>On **L ECAM** display unit<br>- the following message appears :<br>**SMOKE**<br>**AFT COMPT SMOKE**<br>**FWD COMPT SMOKE**<br>**BULK COMPT SMOKE**<br>On **COMPT TEMP** panel **437VU**<br>- **FAULT** legend of **BULK CARGO/ISOL VALVE** pushbutton switch comes on.<br>On **R ECAM** display unit<br>- **BULK** cargo trim air valve position indicating pointer moves to **C**. |
| - release **LOOP TEST** pushbutton switch | On panel **433VU**<br>- **All** warning lights/legends go off.<br>On **CAPT** and **F/O** main instrument panels **3VU** and **5VU**<br>- **MASTER WARN** lights go off.<br>Repetitive chime stops.<br>On **L ECAM** display unit<br>- last message disappears |
| **NOTE** : After this test, it is necessary to select **OFF/R** on | |

| | ACTION | RESULT |
|---|---|---|
| | **COMPT TEMP/ISOL VALVE** pushbutton switches for **BULK** cargo compartment temperature control system resetting. | |
| R | (c)On **COMPT TEMP** panel **437VU**<br>- release **OFF/R ISOL VALVE** pushbutton switch<br><br>- press (in) **OFF/R ISOL VALVE** pushbutton switch | On **COMPT TEMP** panel **437VU**<br>- **OFF/R** legend of **ISOL VALVE** pushbutton switch comes on<br>- **FAULT** legend of **ISOL VALVE** pushbutton switch goes off.<br>- **OFF/R** legend of **ISOL VALVE** pushbutton switch goes off<br>- **FAULT** legend of **ISOL VALVE** pushbutton switch comes on during isolation valve flap movement, then goes off (valve open). |
| R | (d)On **CARGO COMPT SMOKE DET** section of panel **433VU**<br>- release **FWD/LOOP B/OFF, AFT/LOOP B/OFF** and **BULK/LOOP B/OFF** pushbutton switches. | On panel **433VU**<br>- **OFF** legends of **FWD/LOOP B/OFF, AFT/LOOP B/OFF** and **BULK/LOOP B/OFF** pushbutton switches come on.<br>On **CAPT** and **F/O** main instrument panels **3VU** and **5VU**<br>- **MASTER CAUTION** lights come on.<br>Single chime sounds.<br>On **L ECAM** display unit<br>- the following message appears :<br>LOOP<br>**FWD COMPT LOOP B OFF**<br>**AFT COMPT LOOP B OFF**<br>**BULK COMPT LOOP B OFF** |
| R | (e)On **ECAM** control panel (center pedestal)<br><br>- press and release **CLEAR** pushbutton switch | On **CAPT** and **F/O** main instrument panels **3VU** and **5VU**<br>- **MASTER CAUTION** lights go off.<br>On **L ECAM** display unit<br>- last message disappears. |
| R | (f)On **COMPT TEMP** panel **437VU**<br>- place and hold **BULK CARGO** temperature selector in **MAN/HOT** position until trim air valve has reached half open position. | In bulk cargo compartment<br>- trim air valve opens and remains open.<br>On **R ECAM** display unit<br>- **BULK** trim air valve position indicating pointer moves to **H**. |
| R | (g)On **CARGO COMPT SMOKE DET** section of panel **433VU** | On panel **433VU**<br>- **FWD/LOOP A, AFT/LOOP A** and **BULK/** |

| ACTION | RESULT |
|---|---|
| - press and hold **LOOP TEST** pushbutton switch. | **LOOP A** legends come on.<br>- **FWD/SMOKE, AFT/SMOKE BULK/SMOKE** warning lights come on.<br>On **CAPT AND F/O** main instrument panels **3VU** and **5VU**<br>- **MASTER CAUTION** light come on and single chime sounds<br>- **MASTER CAUTION** Lights go off when **MASTER WARN** lights flash.<br>Repetitive chime sounds.<br>On **L ECAM** display unit<br>- the following message appears :<br>**LOOP**<br>**FWD COMPT LOOPS FAULT**<br>**AFT COMPT LOOPS FAULT**<br>**BULK COMPT LOOPS FAULT**<br>then disappears when the following message appears :<br>**SMOKE**<br>**FWD COMPT SMOKE**<br>**AFT COMPT SMOKE**<br>**BULK COMPT SMOKE**<br>On **COMPT TEMP** panel **437VU**<br>- **FAULT** legend of **BULK CARGO/ ISOL VALVE** pushbutton switch comes on.<br>On **R ECAM** display unit<br>- **BULK** trim air valve position indicating pointer moves to **C**. |
| - Release **LOOP TEST** pushbutton switch | On panel **433VU**<br>- all warning lights go off.<br>On **CAPT** and **F/O** main instrument panels **3VU** and **5VU**<br>- **MASTER WARN** lights go off.<br>- repetitive chime stops.<br>On **L ECAM** display unit<br>- **SMOKE** message disappears. |
| **NOTE** : After this test, it is necessary to select **OFF/R** on **COMPT TEMP/ISOL VALVE** pushbutton switches for **BULK** cargo compartment air temperature control system resetting. | |
| R (h)On **COMPT TEMP** panel **437VU**<br>- release **OFF/R ISOL VALVE** pushbutton switch | On **COMPT TEMP** panel **437VU**<br>- **OFF/R** legend of **ISOL VALVE** pushbutton switch comes on. |

| ACTION | RESULT |
|---|---|
| - press (in) OFF/R ISOL VALVE pushbutton switch. | - FAULT legend of ISOL VALVE push-button switch goes off<br>- OFF/R legend of ISOL VALVE push-button switch goes off.<br>- FAULT legend of ISOL VALVE push-button switch comes on during isolation valve flap movement, then goes off (valve open). |
| R (j)On CARGO COMPT SMOKE DET section of panel 433VU | |
| - press FWD/LOOP B/OFF, AFT/LOOP B/OFF and BULK/LOOP B/OFF pushbutton switches. | On panel 433VU<br>- OFF legends of FWD/LOOP B/OFF, AFT/LOOP B/OFF and BULK/LOOP B/OFF pushbutton switches go off.<br>On L ECAM display unit<br>- last message disappears. |
| - release FWD/LOOP A/OFF, AFT/LOOP A/OFF and BULK/LOOP A/OFF pushbutton switches. | on panel 433VU<br>- OFF legends of FWD/LOOP A/OFF, AFT/LOOP A/OFF and BULK/LOOP A/OFF pusbutton switches come on.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION Lights come on.<br>Single chime sounds.<br>On L ECAM display unit<br>- the following message appears :<br>LOOP<br>FWD COMPT LOOP A OFF<br>AFT COMPT LOOP A OFF<br>BULK COMPT LOOP A OFF |
| R Repeat actions described from paragraphs (e) through (j) | The results obtained are the same as in paragraphs (e) through (j) except that LOOP A becomes LOOP B and LOOP B becomes LOOP A. |
| R (k)On CARGO COMPT SMOKE DET section of panel 433VU | |
| - press FWD/LOOP A/OFF, AFT/LOOP A/OFF and BULK/LOOP A/OFF pushbutton switches. | On 433VU<br>- OFF legends of FWD/LOOP A/OFF, AFT/LOOP A/OFF and BULK/LOOP A/OFF pushbutton switches go off.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights go off.<br>On L ECAM display unit<br>- last message disappears |

(3)Test (Test of each channel)

| ACTION | RESULT |
|---|---|
| (a)On ELEC & CARGO COMPT SMOKE DET section of panel 471VU | |
| - place CARGO COMPT LOOP TEST SEL switch IN LOOP A position. | - no change |
| - place smoke detector test selector switch in CARGO COMPT/FWD/1 position. | On ELEC & CARGO COMPT SMOKE DET section of panel 471VU<br>- TEST legend of PTT pushbutton switch comes on. |
| - press and hold PTT pushbutton switch | On CARGO COMPT SMOKE DET section of panel 433VU<br>- LOOP A legend of FWD/LOOP A/OFF pushbutton switch comes on.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights come on.<br>Single chime sounds.<br>On L ECAM display unit<br>- the following message appears :<br>LOOP<br>FWD COMPT LOOP FAULT. |
| - release PTT pushbutton switch | On CARGO COMPT SMOKE DET section of panel 433VU<br>- LOOP A legend of FWD/LOOP A/OFF pushbutton switch goes off.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights go off.<br>On L ECAM display unit<br>- last message disappears. |
| On ELEC & CARGO COMPT SMOKE DET section of panel 471VU<br>- repeat actions described above placing test selector switch successively in the FWD/2, AFT/1, AFT/2, BULK positions. | On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights come on.<br>Single chime sounds.<br>On L ECAM display unit<br>- message appears.<br>Other results obtained according to the position of test selector switch are shown on the table. |
| On ELEC & CARGO COMPT SMOKE DET section of panel 471VU<br>- place smoke detector test selector switch in NORM FLT position. | On ELEC & CARGO COMPT SMOKE DET section of panel 471VU<br>- TEST legend of PTT pushbutton switch goes off. |
| - place CARGO COMPT LOOP TEST SEL switch in LOOP B position. | - no change. |
| - place smoke detector test selector switch in CARGO | - TEST legend of PTT pushbutton switch comes on. |

| ACTION | RESULT |
|---|---|
| COMPT/FWD 1 position.<br>- repeat actions described in paragraph (a) above, placing test selector switch successively in the FWD/2, AFT/1, AFT/2, BULK positions. | On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER CAUTION lights come on.<br>Single chime sounds.<br>On L ECAM display unit<br>- message appears.<br>Other results obtained according to the position of test selector switch are shown on the table. |
| - place ELEC & CARGO COMPT SMOKE DET selector switch in NORM FLT position. | On panel 471VU<br>- TEST legend of PTT pushbutton switch goes off. |

| CARGO COMPT LOOP TEST SEL SWITCH POSITION ON 471VU | SMOKE DET TEST SELECTOR SWITCH POSITION ON 471VU | ASSOCIATED LOOP LEGEND ON 433VU |
|---|---|---|
| LOOP A | CARGO COMPT/ FWD/1 | FWD/LOOP A |
| LOOP A | CARGO COMPT/ FWD/2 | FWD/LOOP A |
| LOOP A | CARGO COMPT/ AFT/1 | AFT/LOOP A |
| LOOP A | CARGO COMPT/ AFT/2 | AFT/LOOP A |
| LOOP A | CARGO COMPT/ BULK | BULK/LOOP A |
| LOOP B | CARGO COMPT/ FWD/1 | FWD/LOOP B |
| LOOP B | CARGO COMPT/ FWD/2 | FWD/LOOP B |
| LOOP B | CARGO COMPT/ AFT/1 | AFT/LOOP B |
| LOOP B | CARGO COMPT AFT/2 | AFT/LOOP B |
| LOOP B | CARGO COMPT BULK | BULK/LOOP B |

(4)Close-up
  (a)Place BULK CARGO temperature selector in AUTO position.
  (b)Reset ISOL VALVE pushbutton switch.
  (c)Place COMPT/DUCT temperature selector switch in CRT position.
  (d)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
  (e)Restore system and aircraft to normal operating condition.

2. Functional Test

A. Reason for the Job
(1)To read CONTROL UNIT/BITE MFA on lateral panel.

R

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Access Platforms |
| Referenced Procedures | |
| - 21-21-00, P. Block 301 | Flight Compartment and Electronics Racks Air Distribution |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 52-33-00, P. Block 1 | Cargo Compartment Door Opening |

C. Procedure
(1)Job set-up
(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Close overhead panel circuit breakers, particularly those associated with AVIONICS/SMOKE DET and CARGO/SMOKE DET.

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AVIONICS/SMOKE DET/DETECTORS | 1WA | 204/F25 |
| 22VU | AVIONICS/SMOKE DET/DETECTORS | 2WA | 204/F26 |
| 22VU | CARGO/SMOKE DET/PWR/SUPPLY | 35WH | 209/A26 |
| 22VU | CARGO/SMOKE DET/WARN | 46WH | 209/A25 |

(2)Test

| ACTION | RESULT |
|---|---|
| 1. On maintenance panel 471VU<br>- press MFA RESET pushbutton switch | On panel 471VU<br>- BITE DISPLAY MFA is reset |
| 2. In flight compartment :<br>A. On panel 22VU<br>- Open circuit breaker CARGO/ SMOKE DET/WARN 46WH (209/A25) | |
| B. On maintenance panel 472VU<br>- place ANN LT switch in READ position. | On ELEC & CARGO COMPT SMOKE DET segment of panel 471VU<br>- UNIT/CARGO/BITE DISPLAY MFA comes on. |
| C. Close circuit breaker 46WH<br>- press RESET pushbutton switch | no change |
| 3. On maintenance panel 471VU<br>- press MFA RESET pushbutton switch. | On maintenance panel 471VU<br>- UNIT CARGO/BITE DISPLAY MFA |

| ACTION | RESULT |
|---|---|
| | goes off. |

(3)Close-up
(a)On panel 472VU, place ANN LT switch in OFF position.
(b)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(c)Restore system and aircraft to normal operating condition.

3. Functional Test

A. Reason for the Job
(1)To check correct operation of warnings associated with smoke detection circuit power supplies and to perform BITE test of smoke detection control unit with associated MFA display on lateral panel.

R

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Access Platforms |
| Referenced Procedures | |
| - 21-21-00, P. Block 301 | Flight Compartment and Electronics Racks Air Distribution |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 52-33-00, P. Block 1 | Cargo Compartment Door Opening |

C. Procedure
(1)Job set-up
(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that electronics racks ventilation is correct (Ref. 21-21-00, P. Block 301).
(c)Close overhead panel circuit breakers, particularly those associated with AVIONICS/SMOKE DET and CARGO/SMOKE DET.

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AVIONICS/SMOKE DET/DETECTORS | 1WA | 204/F25 |
| 22VU | AVIONICS/SMOKE DET/DETECTORS | 2WA | 204/F26 |
| 22VU | CARGO/SMOKE DET/PWR/SUPPLY | 35WH | 209/A26 |
| 22VU | CARGO/SMOKE DET/WARN | 46WH | 209/A25 |

(d)Position access platforms to forward and aft cargo compartment doors.
(e)Open forward and aft cargo compartment doors (Ref. 52-33-00, P. Block 1)
(f)Open door 132AZ for access to avionics compartment.
(g)Make certain that
1 In rack 96VU, shelf 96VU, on smoke detection control unit 18WH, all warning lights are off.

2 On CARGO COMPT SMOKE DET panel 433VU, all warning lights and legends of pushbutton switch are off.

(2)Test

| ACTION | RESULT |
|---|---|
| 1. In shelf 96VU, on smoke detection control unit 18WH<br>- press and hold TEST pushbutton switch.<br>- Release TEST pushbutton switch | In shelf 96VU, on smoke detection control unit 18WH<br>- all warning lights come on<br>On smoke detection control unit 18WH.<br>- all warning lights go off. |
| 2. On maintenance panel 471VU<br>- press MFA RESET pushbutton switch | On panel 471VU<br>- BITE DISPLAY MFA is reset |
| 3. In flight compartment :<br>A. On panel 22VU<br>- Open circuit breaker CARGO/ SMOKE DET/WARN 46WH (209/A25) | |
| B. On maintenance panel 472VU<br>- place ANN LT switch in READ position. | On ELEC & CARGO COMPT SMOKE DET segment of panel 471VU<br>- UNIT/CARGO/BITE DISPLAY MFA comes on. |
| C. Close circuit breaker 46WH | no change |
| 4. In shelf 96VU, on smoke detection control unit<br>- press RESET pushbutton switch | |
| R NOTE : When BITE test of smoke detection control unit and check of "control R unit/BITE display" MFA activation on lateral panel are done, steps 5. R thru 9. can be ignored. | |
| 5. On maintenance panel 471VU<br>- press MFA RESET pushbutton switch. | On maintenance panel 471VU<br>- UNIT CARGO/BITE DISPLAY MFA goes off. |
| 6. In zone 131<br>Disconnect connector from forward cargo compartment smoke detector 3WH. | In shelf 96VU on smoke detection control unit 18WH<br>- FWD CARGO LOOP A1 light comes on.<br>On maintenance panel 471VU<br>- UNIT CARGO/BITE DISPLAY MFA comes on. |
| Reconnect connector to smoke detector 3WH | no change |
| 7. In shelf 96VU, on smoke detection control unit 18WH<br>- press and hold TEST pushbutton switch | On control unit 18WH<br>- all indicator lights come on |

| ACTION | RESULT |
|---|---|
| - release TEST pushbutton switch<br>- press RESET pushbutton switch. | - all indicator lights go off |
| 8. On maintenance panel 471VU<br>- press MFA RESET pushbutton switch | On maintenance panel 471VU<br>- UNIT CARGO/BITE DISPLAY MFA goes off. |
| 9. Disconnect successively the connector of each detector listed below. Repeat actions described in step 5, 6 & 7 | Results are similar to those described in step 5, 6 & 7 with illumination and extinguishing of warning lights in front of smoke detection control unit 18WH corresponding to the smoke detector concerned. |

| SMOKE DETECTOR | ZONE | WARNING LIGHTS ON 18WH |
|---|---|---|
| 43WH | 131 | FWD CARGO/LOOP A/2 |
| 4WH | 132 | FWD CARGO/LOOP B/1 |
| 42WH | 132 | FWD CARGO/LOOP B/2 |
| 9WH | 151 | AFT CARGO/LOOP A/1 |
| 45WH | 151 | AFT CARGO/LOOP A/2 |
| 8WH | 152 | AFT CARGO/LOOP B/1 |
| 44WH | 152 | AFT CARGO/LOOP B/2 |
| 11WH | 161 | BULK CARGO/LOOP A |
| 10WH | 161 | BULK CARGO/LOOP B |

(3)Close-up
(a)On panel 472VU, place ANN LT switch in OFF position.
(b)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(c)Close door 132AZ
(d)Close FWD and AFT cargo compartment doors. (Ref. 52-33-00, P. Block 1)
(e)Remove access platforms
(f)Restore system and aircraft to normal operating condition.

# CARGO COMPARTMENT SMOKE DETECTOR - CLEANING/PAINTING

1. Reason for the Job
   To remove and clean cargo compartment smoke detectors.

2. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform 2.7 to 3.0 m (9.0 to 10.0 ft.) |
| B. | Vendor CMM |
| Referenced Procedures | |
| - 26-16-00, P. Block 501 | Cargo Compartment Smoke Detection |
| - 26-16-11, P. Block 401 | Smoke Detector |
| - 52-30-00, P. Block 301 | FWD and AFT Cargo Compartment Doors |

3. Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | CARGO/SMOKE DET/WARN | 46WH | 209/A25 |
| 22VU | CARGO/SMOKE DET/PWR/SUPPLY | 35WH | 209/A26 |

(2)Position access platform and open relevant cargo compartment door and secure with safety lock (Ref. 52-30-00, P. Block 301).

B. Cleaning of Smoke Detector
(1)Remove smoke detector (Ref. 26-16-11, P. Block 401).
(2)Clean smoke detector in workshop (Ref. Vendor CMM).
(3)Install smoke detector (Ref. 26-16-11, P. Block 401).

C. Test
(1)Remove safety clips and tags and close circuit breakers 35WH and 46WH.
(2)Carry out operational test of cargo compartment smoke detection (Ref. 26-16-00, P. Block 501).

D. Close-Up
(1)Make certain that work area is clean and clear of tools and other items.
(2)Remove safety lock and close cargo compartment door (Ref. 52-30-00, P. Block 301).
(3)Remove access platform.

1. Smoke Detectors - Operational Test of the Remaining Detectors

Ref. MMEL 26-16-01-1 (FAA only)

A. Reason for the Job

(1)Refer MMEL 26-16-01-1 (FAA only).

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedures | |
| - 21-21-00, P. Block 301 | Flight Compartment and Electronics Racks Air Distribution |
| - 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure

(1)Job set-up

(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Make certain that electronics racks ventilation system is correct (Ref. 21-21-00, P. Block 301).

(c)Make certain that the appropriate circuit breakers are closed, particularly those associated with cargo compartment smoke detection and ECAM :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AVIONICS SMOKE DET/DETECTORS | 1WA | 204/F25 |
| 22VU | AVIONICS SMOKE DET/DETECTORS | 2WA | 204/F24 |
| 21VU | ECAM/FLT WARN/MONITOR | 4WW | 108/B 6 |
| 21VU | ECAM/FWC 1 | 7WW | 108/B 8 |
| 21VU | ECAM/FWC 2 | 32WW | 109/A 8 |
| 21VU | ECAM/SDAC/PWR/SUPPLY | 6WV | 109/A 5 |
| 21VU | ECAM/CTL PNL/LT | 12WT | 108/B 1 |

(d)On COMPT TEMP panel 437VU, make certain that ISOL VALVE pushbutton switch is pressed (in).

(e)On COMPT TEMP panel 437VU, place COMPT/DUCT temperature selector switch in BULK CARGO position.

(f)On ECAM control panel (center pedestal)

- press and release COND pushbutton switch, AIR COND page appears on R ECAM display unit.

(2)Test

| ACTION | RESULT |
|---|---|
| On COMPT TEMP panel 437VU<br>- place and hold BULK CARGO temperature selector in MAN/HOT position until trim air valve has at least reached half open position. | In bulk cargo compartment<br>- trim air valve opens and remains open.<br>On R ECAM display unit<br>- BULK trim air valve position |

| ACTION | RESULT |
|---|---|
| | indicating pointer moves to H position. |
| On ELEC & CARGO COMPT SMOKE DET section of panel 471VU<br>- place smoke detector test selector switch 16WA in position corresponding to the remaining detector. | On panel 471VU<br>- TEST legend of PTT pushbutton switch comes on. |
| - press and hold PTT pushbutton switch | On CARGO COMPT SMOKE DET section of panel 433VU<br>- For FWD cargo compartment : FWD/SMOKE warning light comes on.<br>- For AFT and BULK cargo compartments : AFT & BULK/SMOKE warning light comes on.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights flash<br>Repetitive chime sounds.<br>On L ECAM display unit.<br>- message starting with SMOKE appears. |
| - release PTT pushbutton switch | On CARGO COMPT SMOKE DET section of panel 433VU<br>- SMOKE warning light goes off.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights go off.<br>Repetitive chime stops.<br>On L ECAM display unit<br>- last message disappears. |

R R R

| DETECTOR FAILURE | SMOKE DET TEST SELECTOR SWITCH POSITION |
|---|---|
| FWD1 | FWD2 |
| FWD2 | FWD1 |
| AFT1 | AFT2 |
| AFT2 | AFT1 |
| BULK1 | BULK2 |
| BULK2 | BULK1 |

D. Close-Up

(1)Place smoke detector test selector switch **16WA** in **NORM FLT** position.
(2)Place **BULK CARGO** temperature selector in **AUTO** position.
(3)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(4)Reset **ISOL VALVE** pushbutton switch.
(5)Restore system and aircraft to normal operating conditions.

## 1. Detection Loops - Deactivation and Operational Test of the Remaining Loop

Ref. MMEL 26-16-01-2 (FAA only)

A. Reason for the Job

(1)Refer MMEL 26-16-01-2 (FAA only)

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedures | |
| - 21-21-00, P. Block 301 | Flight Compartment and Electronics Racks Air Distribution |
| - 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure

(1)Job set-up

(a)Energize the aircraft electrical network (Ref.24-41-00, P. Block 301).

(b)Make certain that electronics racks ventilation is correct (Ref. 21-21-00, P. Block 301).

(c)Close overhead panel circuit breakers, particularly those associated with cargo compartment smoke detection and ECAM.

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AVIONICS SMOKE DET/DETECTORS | 1WA | 204/F25 |
| 22VU | AVIONICS SMOKE DET/DETECTORS | 2WA | 204/F24 |
| 22VU | CARGO SMOKE DET/PWR/SUPPLY | 35WH | 209/A26 |
| 22VU | CARGO SMOKE DET/WARN | 46WH | 209/A25 |
| 21VU | ECAM/FLT WARN/MONITOR | 4WW | 108/B 6 |
| 21VU | ECAM/FWC 1 | 7WW | 108/B 8 |
| 21VU | ECAM/FWC 2 | 32WW | 109/A 8 |
| 21VU | ECAM/SDAC/PWR/SUPPLY | 6WV | 109/A 5 |
| 21VU | ECAM/CTL PNL/LT | 12WT | 108/B 1 |

(d)On CARGO COMPT SMOKE DET section of panel 433VU, make certain that FWD/LOOP A, FWD/LOOP B, AFT/LOOP A, AFT/LOOP B, BULK/LOOP A and BULK/LOOP B pushbutton switches are pressed (in).

(e)On COMP TEMP panel 437VU, place COMPT/DUCT temperature selector switch in BULK CARGO position and make certain that ISOL VALVE pushbutton switch is pressed (in).

(f)On ECAM control panel (center pedestal)

- press and release COND pushbutton switch, AIR COND page appears on R ECAM display unit.

(2)Test

NOTE : As during the test, the response time of each detection loop is different, LOOP warnings (single chime and ECAM message) may appear during test sequence. These warnings disappear as soon as SMOKE warning (ECAM message) is activated.
For the same reason, SMOKE warnings (FWD, AFT, BULK) are not

generated simultaneously, thus causing a discontinuity of the repetitive chime due to the designed priorities of the warning controllers.
Actually, the operator must first of all take into account the positive result of the test and not the system transients which may occur during the test sequence.

| ACTION | RESULT |
|---|---|
| (a)On **COMPT TEMP** panel **437VU**<br>- place and hold **BULK CARGO** temperature selector in **MAN/HOT** position until trim air valve has reached half open position | In bulk cargo compartment<br>- trim air valve opens and remains open.<br>On **R ECAM** display unit<br>- **BULK** cargo trim air valve position indicating pointer moves to **H** position. |
| (b)On **CARGO COMPT SMOKE DET** section of panel **433VU**<br>- release the pushbutton switch related to the inoperative loop :<br>. if **FWD** Loop **A** fault, release **FWD/LOOP A/OFF** pushbutton switch,<br>. if **FWD** Loop **B** fault, release **FWD/LOOP B/OFF** pushbutton switch,<br>. if **AFT** Loop **A** fault, release **AFT/LOOP A/OFF** pushbutton switch,<br>. if **AFT** Loop **B** fault, release **AFT/LOOP B/OFF** pushbutton switch,<br>. if **BULK** Loop **A** fault, release **BULK/LOOP A/OFF** pushbutton switch,<br>. if **BULK** Loop **B** fault, release **BULK/LOOP B/OFF** pushbutton switch. | On panel **433VU**<br>- **OFF** legend of the related pushbutton switch comes on. |
| - press and hold **LOOP TEST** pushbutton switch | - if **FWD** Loop **A** fault :<br>. **FWD/SMOKE, FWD/LOOP B** warning lights come on,<br>. **AFT/SMOKE, AFT/LOOP A, AFT/LOOP B** warning lights come on,<br>. **BULK/SMOKE, BULK/LOOP A, BULK/LOOP B** warning lights come on.<br>- if **FWD** Loop **B** fault :<br>. **FWD/SMOKE, FWD/LOOP A** warning lights come on,<br>. **AFT/SMOKE, AFT/LOOP A, AFT/LOOP B** warning lights come on.<br>. **BULK/SMOKE, BULK/LOOP A, BULK/LOOP B** warning lights come on.<br>- if **AFT** Loop **A** fault :<br>. **FWD/SMOKE, FWD/LOOP A, FWD/LOOP B** |

| ACTION | RESULT |
|---|---|
| | warning lights come on,<br>. AFT/SMOKE, AFT/LOOP B warning lights come on.<br>. BULK/SMOKE, BULK/LOOP A, BULK/LOOP B warning lights come on.<br>- if AFT Loop B fault :<br>. FWD/SMOKE, FWD/LOOP A, FWD/LOOP B warning lights come on,<br>. AFT/SMOKE, AFT/LOOP A warning lights come on.<br>. BULK/SMOKE, BULK/LOOP A, BULK/LOOP B warning lights come on.<br>- if BULK Loop A fault :<br>. FWD/SMOKE, FWD/LOOP A, FWD/LOOP B warning lights come on,<br>. AFT/SMOKE, AFT/LOOP A, AFT/LOOP B warning lights come on.<br>. BULK/SMOKE, BULK/LOOP B warning lights come on.<br>- if BULK Loop B fault :<br>. FWD/SMOKE, FWD/LOOP A, FWD/LOOP B warning lights come on,<br>. AFT/SMOKE, AFT/LOOP A, AFT/LOOP B warning lights come on.<br>. BULK/SMOKE, BULK/LOOP A warning lights come on.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights flash.<br>Repetitive chime sounds.<br>On L ECAM display unit<br>- the following message appears :<br>SMOKE<br>AFT COMPT SMOKE<br>FWD COMPT SMOKE<br>BULK COMPT SMOKE<br>On COMPT TEMP panel 437VU<br>- FAULT legend of BULK CARGO/ISOL VALVE pushbutton switch comes on.<br>On R ECAM display unit<br>- BULK cargo trim air valve position indicating pointer moves to C. |
| - release LOOP TEST pushbutton switch | On panel 433VU<br>- all annunciator lights go off.<br>On CAPT and F/O main instrument panels 3VU and 5VU<br>- MASTER WARN lights go off. |

| ACTION | RESULT |
|---|---|
| | Repetitive chime stops.<br>On L ECAM display unit<br>- last message disappears |
| NOTE : After this test, it is necessary to press BULK CARGO /ISOL VALVE pushbutton switch for BULK cargo compartment control system resetting. | |
| On COMPT TEMP panel 437VU<br>- release ISOL VALVE pushbutton switch | On COMPT TEMP panel 437VU<br>- OFF/R legend of ISOL VALVE pushbutton switch comes on<br>- FAULT legend of ISOL VALVE pushbutton switch goes off |
| - press (in) OFF/R ISOL VALVE pushbutton switch | - OFF/R legend of ISOL VALVE push-button switch goes off.<br>- FAULT legend of ISOL VALVE push-button switch comes on during isolation valve flap movement, then goes off (valve open). |

(4)Close-up
(a)Place BULK CARGO temperature selector in AUTO position.
(b)Reset ISOL VALVE pushbutton switch.
(c)Place COMPT/DUCT temperature selector switch in CRT position.
(d)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(e)Restore system and aircraft to normal operating condition.

2. Reactivation

A. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedures | |
| - 21-21-00, P. Block 301 | Flight Compartment and Electronics Racks Air Distribution |
| - 24-41-00, P. Block 301 | AC External Power Control |

B. Procedure

(1)Job set-up

(a)Energize the aircraft electrical network (Ref.24-41-00, P. Block 301).

(b)Make certain that electronics racks ventilation is correct (Ref. 21-21-00, P. Block 301).

(c)Close overhead panel circuit breakers, particularly those associated with cargo compartment smoke detection and ECAM.

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AVIONICS SMOKE DET/DETECTORS | 1WA | 204/F25 |
| 22VU | AVIONICS SMOKE DET/DETECTORS | 2WA | 204/F24 |
| 22VU | CARGO SMOKE DET/PWR/SUPPLY | 35WH | 209/A26 |
| 22VU | CARGO SMOKE DET/WARN | 46WH | 209/A25 |
| 21VU | ECAM/FLT WARN/MONITOR | 4WW | 108/B 6 |
| 21VU | ECAM/FWC 1 | 7WW | 108/B 8 |
| 21VU | ECAM/FWC 2 | 32WW | 109/A 8 |
| 21VU | ECAM/SDAC/PWR/SUPPLY | 6WV | 109/A 5 |
| 21VU | ECAM/CTL PNL/LT | 12WT | 108/B 1 |

## SMOKE DETECTOR - REMOVAL/INSTALLATION

WARNING : SMOKE DETECTOR CONTAINS RADIOACTIVE CHEMICAL, AMERICIUM 241, OF APPROXIMATELY 0.8 MICROCURIES.

NOTE : Removal/Installation for all smoke detectors is similar.

### 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 2.3 m (7.5 ft.) |
| B. | Blanking Caps |
| C. | Circuit Breaker Safety Clips and Tags |

Referenced Procedures

| | |
|---|---|
| - 26-16-00, P. Block 501 | Cargo Compartment Smoke Detection |
| - 52-30-00, P. Block 301 | FWD and AFT Cargo Compartment Doors |

R **ON A/C 101-200,

R Post SB 28-2105 For A/C 101-200,

R Referenced Procedures

| | |
|---|---|
| R - 26-16-00, P. Block 501 | Cargo Compartment Smoke Detection |
| R - 28-11-36, P. Block 401 | Additional Center Tank |
| R - 52-30-00, P. Block 301 | FWD and AFT Cargo Compartment Doors |

### 2. Procedure

R **ON A/C ALL

(Ref. Fig. 401)

A. Job Set-Up

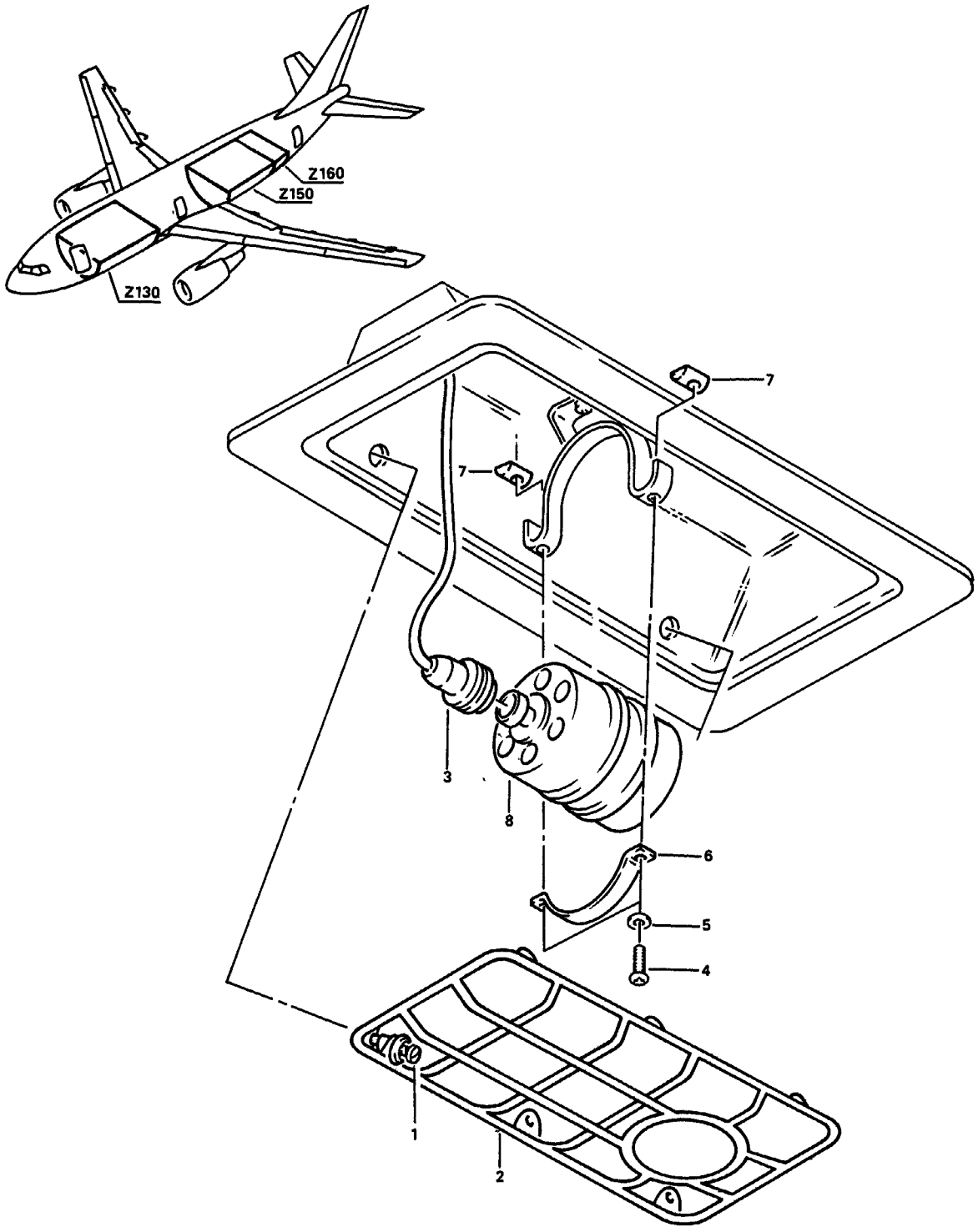
(1)Open, safety and tag the following circuit breakers:

R **ON A/C 101-200,

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | AVIONICS/SMOKE DET/DETECTORS | 2WA | F24 |
| 22VU | AVIONICS/SMOKE DET/DETECTORS | 1WA | F25 |

R **ON A/C 001-100,

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | CARGO/SMOKE DET/WARN | 46WH | A25 |
| 22VU | CARGO/SMOKE DET/PWR/SUPPLY | 35WH | A26 |




BM6 26 16 11 4 AA M 0–24

Smoke Detector
Figure 401

R **ON A/C ALL

(2)Position access platform and open relevant cargo compartment door and secure with safety lock (Ref. 52-30-00, P. Block 301).

R **ON A/C 101-200,

R Post SB 28-2105 For A/C 101-200,

R (3)Remove Aft ACT (Ref. 28-11-36, P. Block 401) to gain access to Smoke
R Detectors 8WH and 9WH.

**ON A/C ALL

B. Removal
(1)Release camlocs (1) and remove protective grill (2).
(2)Disconnect and cap electrical connector (3).
(3)Remove screws (4), washers (5), clamp half (6), nuts (7) and smoke detector (8).

C. Preparation of Replacement Component
(1)Remove blanking caps from replacement component.
R (2)Make sure that the seals are air tight where the electrical harness goes
R through. Renew the seals if necessary.

D. Installation
CAUTION : MAKE SURE THAT DETECTOR IS INSTALLED SO THAT CONDENSATION DRAIN HOLES ARE POSITIONED AT THE DETECTOR UNDERSURFACE.
(1)Position smoke detector (8) and clamp half (6) and secure with screws (4) washers (5) and nuts (7).
(2)Connect electrical connector (3).
(3)Position protective grill (2) and secure with camlocs (1).

E. Test
(1)Perform operational test of relevant smoke detector (Ref. 26-16-00, P. Block 501).

F. Close-Up
(1)Make certain that working area is clean, and clear of tools and miscellaneous items of equipment.
(2)Remove safety lock and close cargo compartment door (Ref. 52-30-00, P. Block 301).
(3)Remove access platform.

**ON A/C 101-200,

Post SB 28-2105 For A/C 101-200,

F. Close-Up
(1)Make certain that working area is clean, and clear of tools and miscellaneous items of equipment.
(2)Install aft ACT, if removed (Ref. 28-11-36, P. Block 401).
(3)Remove safety lock and close cargo compartment door (Ref. 52-30-00, P.Block 301).
(4)Remove access platform.

# CARGO SMOKE DETECTION CONTROL UNIT - REMOVAL/INSTALLATION

## 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Circuit Breaker Safety Clips |
| Referenced Procedure<br>- 26-16-00, P. Block 501 | Cargo Compartment Smoke Detection |

## 2. Procedure

A. Job Set-Up
(1)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | CARGO/SMOKE DET/PWR/SUPPLY | 35WH | 209/A26 |
| 22VU | CARGO/SMOKE DET/WARN | 46WH | 209/A25 |

(2)Position access platform at FWD cargo compartment door.
(3)Open FWD cargo compartment door.
(4)Open door 132AZ for access to avionics compartment.

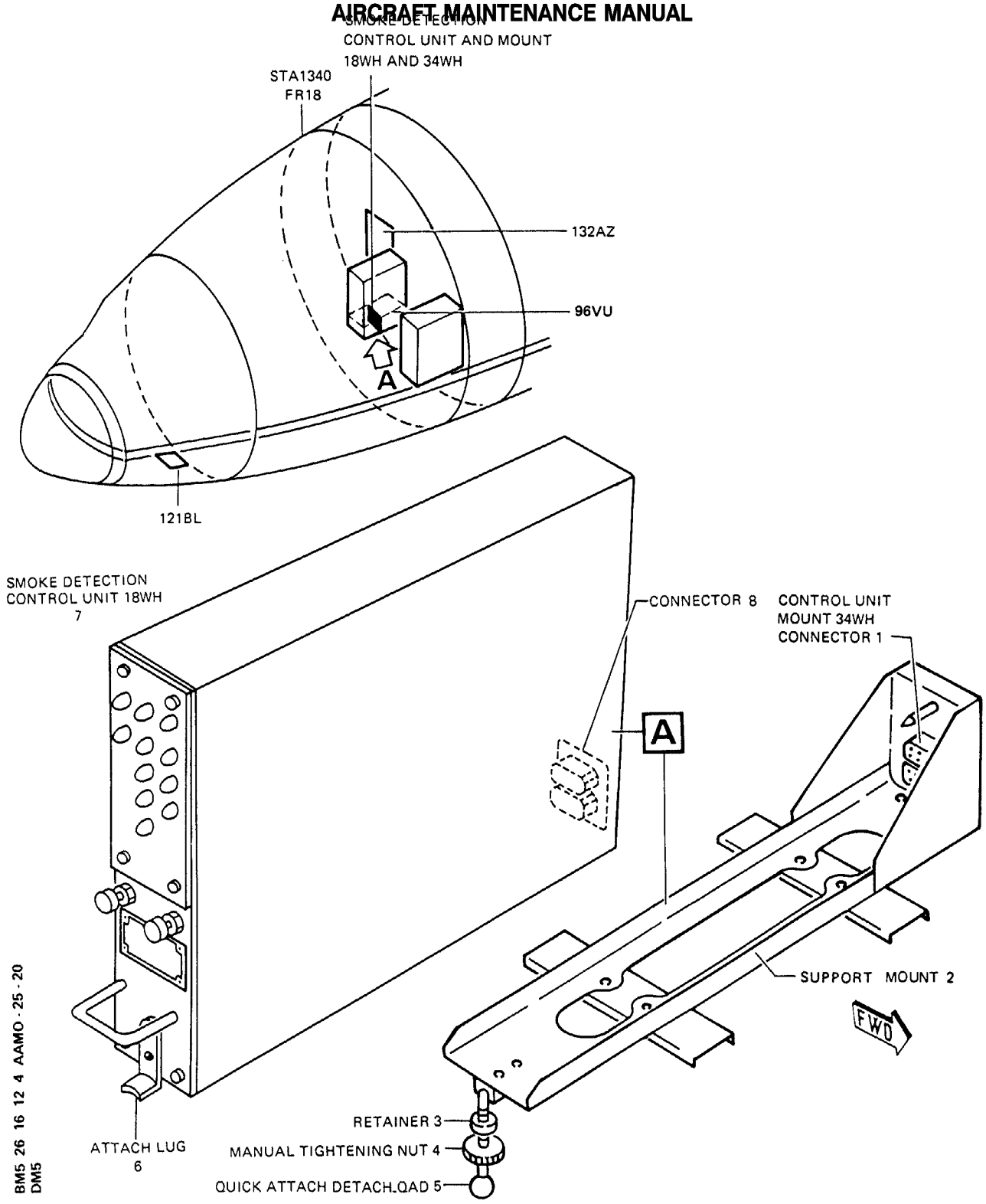
B. Removal (Ref. Fig. 401)
(1)Remove side panel (on same side as access door 132AZ) of shelf 96VU (zone 122) in which smoke detection control unit (18WH) is located
(2)On quick attach-detach fastener (5) securing control unit to mount (2), unscrew manual tightening nut (4) until retainer (3) over control unit (7) attach lug is free (6).
(3)Slide out control unit (7) along mount, using handle. Remove from rack.

C. Preparation of Replacement Component
(1)Remove protective cap form electrical receptacle.
(2)Carry out a visual check of the control unit.

D. Installation (Ref. Fig. 401)
(1)Place control unit (7) on mount (2) and slide carefully to back of rack, so that connector (8) engages correctly.
(2)Lift up quick attach-detach fastener (5) ; install retainer (3) over attach lug (6), tighten manual tightening nut (4).

E. Test
(1)Remove safety clips and tags and close circuit breakers 35WH and 46WH.
(2)Carry out functional test of control unit (Ref. 26-16-00, P. Block 501).

F. Close-Up
(1)Inspect control unit adjacent area and make certain that working area (shelf 96VU) is clean and clear of tools and miscellaneous items of equipment.
(2)Clean working area if necessary.




Cargo Smoke Detection Control Unit
Figure 401

(3)Close shelf 96VU by installing and attaching the side panel.
(4)Close access door 121BL.
(5)Close FWD cargo compartment door.
(6)Remove access platform FWD cargo compartment door.

## LAVATORY SMOKE DETECTION - DESCRIPTION AND OPERATION

1. General

The smoke detection system enables an outbreak of fire in the lavatory to be detected rapidly while still at the smouldering stage, long before flames appear or before there is an appreciable rise in temperature. The lavatory smoke detectors are of the ionization and/or the optical type.

2. Component Location

**ON A/C 101-200,

(Ref. Fig. 001)

**ON A/C 001-100,

(Ref. Fig. 002)

R **ON A/C 101-103, 105-105,

(Ref. Fig. 003)

**ON A/C 001-005,

(Ref. Fig. 004)

R **ON A/C 101-104, 106-200,

Post SB 26-2023 For A/C 101-103,

(Ref. Fig. 005)

**ON A/C 001-100,

Post SB 26-2023 For A/C 001-005,

(Ref. Fig. 006)

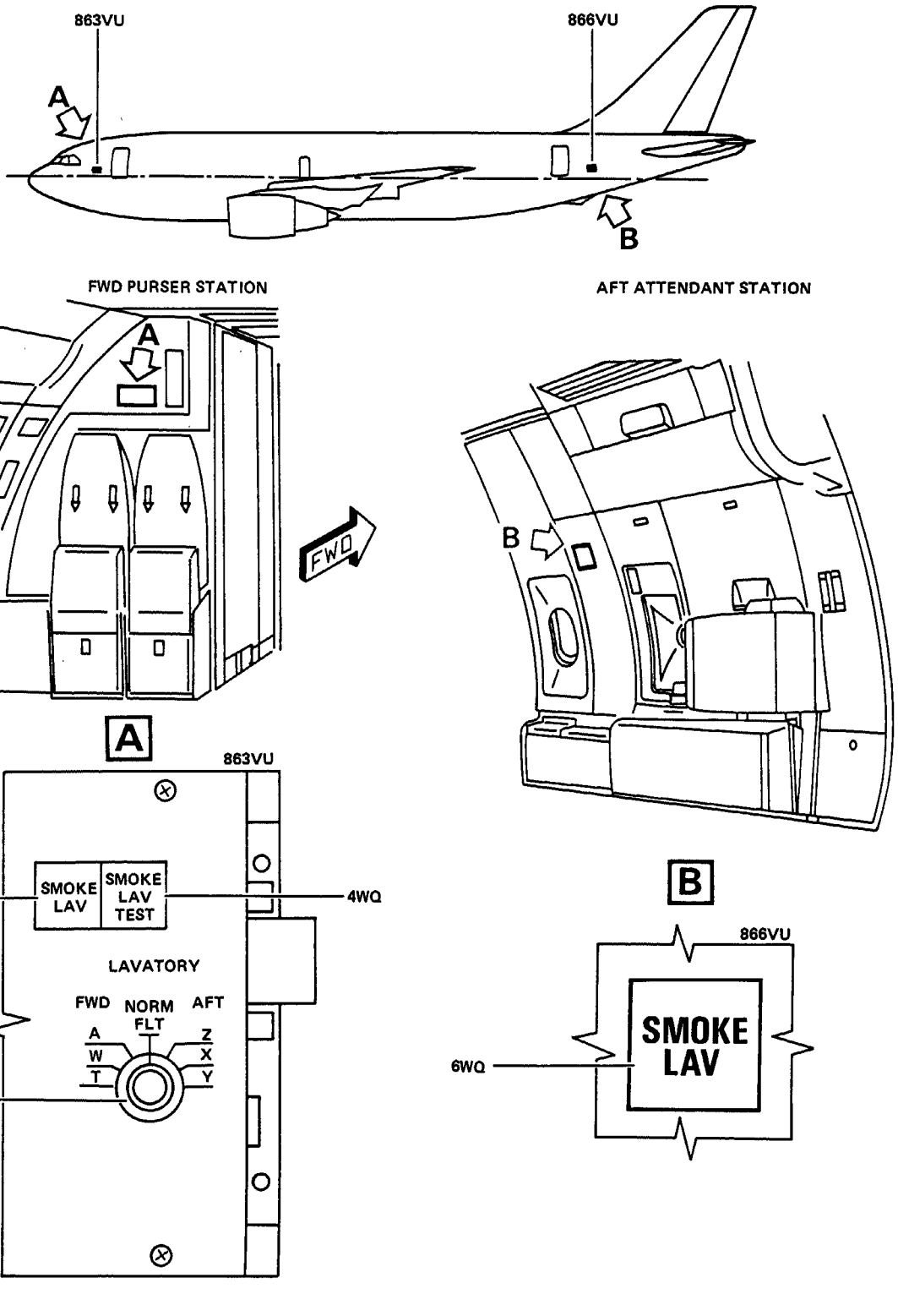
**ON A/C 001-005,

(Ref. Fig. 007)

R **ON A/C 101-103, 105-105,

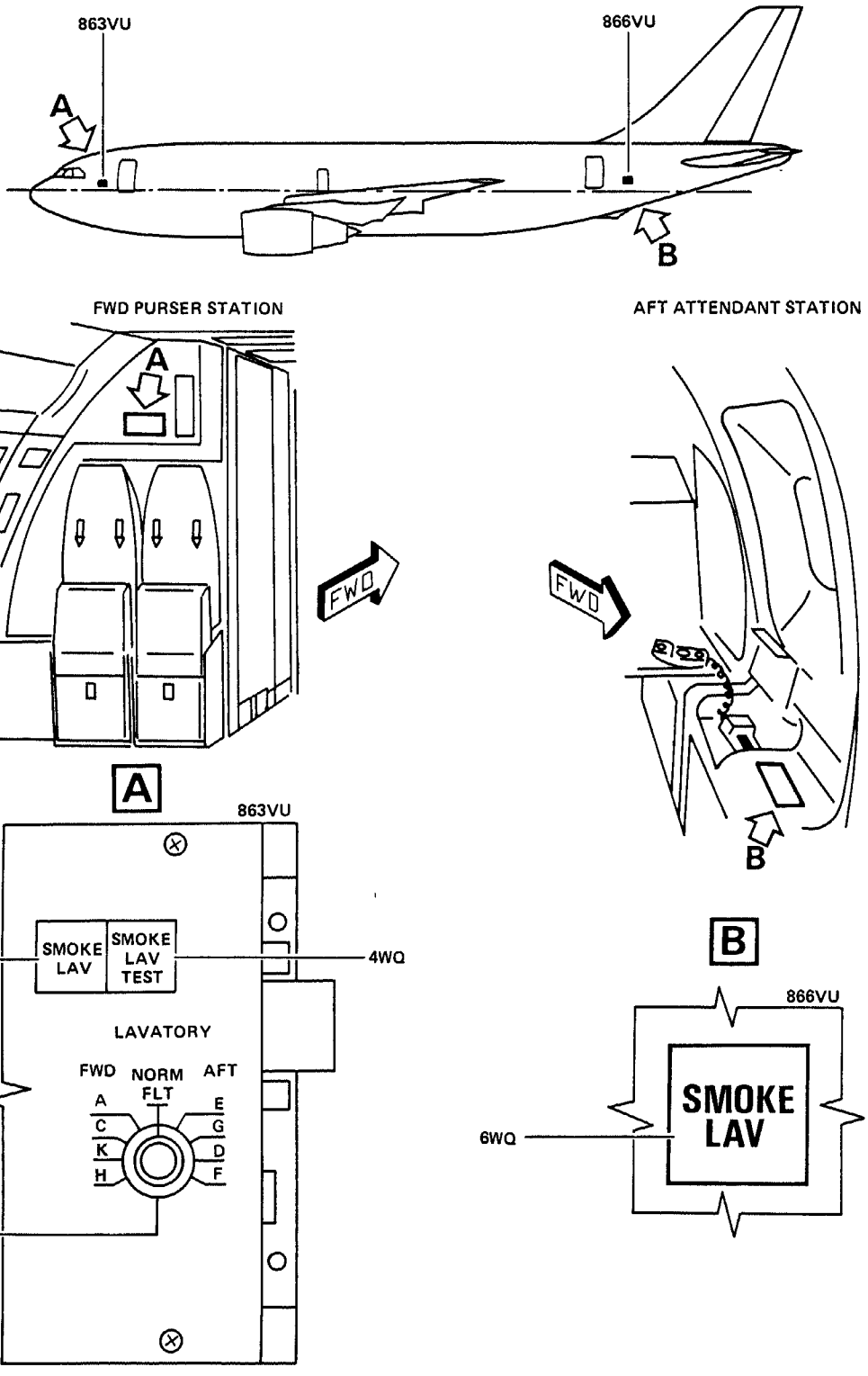
(Ref. Fig. 008)

**ON A/C 001-100,



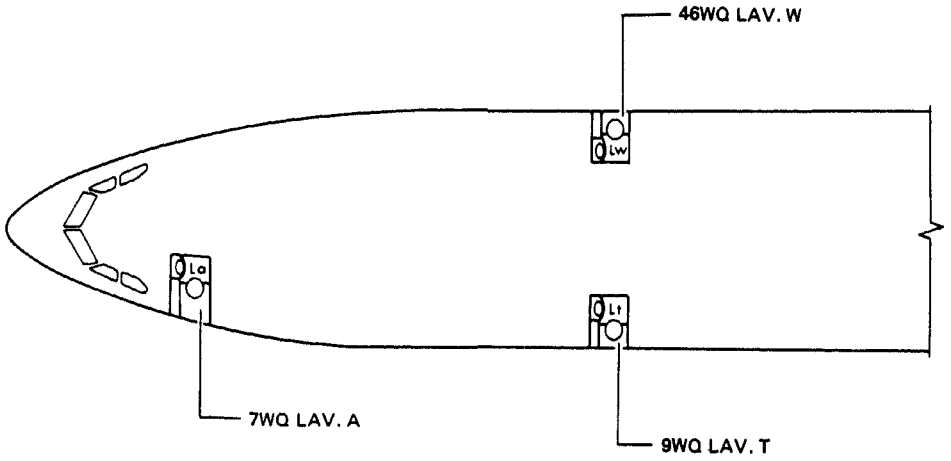

BM5 26 17 00 0 0AMO - 00

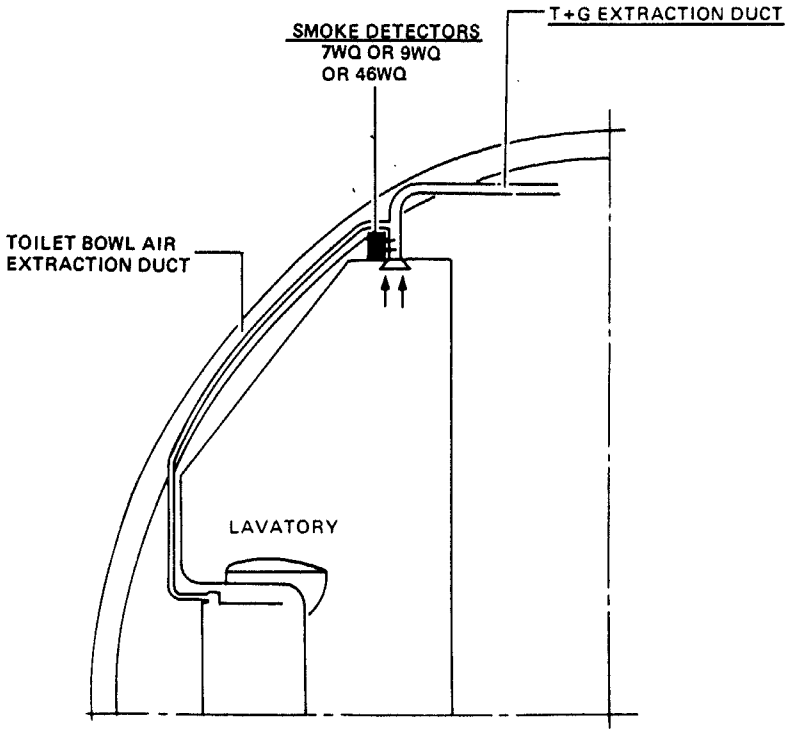
Lavatory Smoke Detection - Component Location
Figure 001




BM5 26 17 00 0 FANO 00

Lavatory Smoke Detection - Component Location
Figure 002

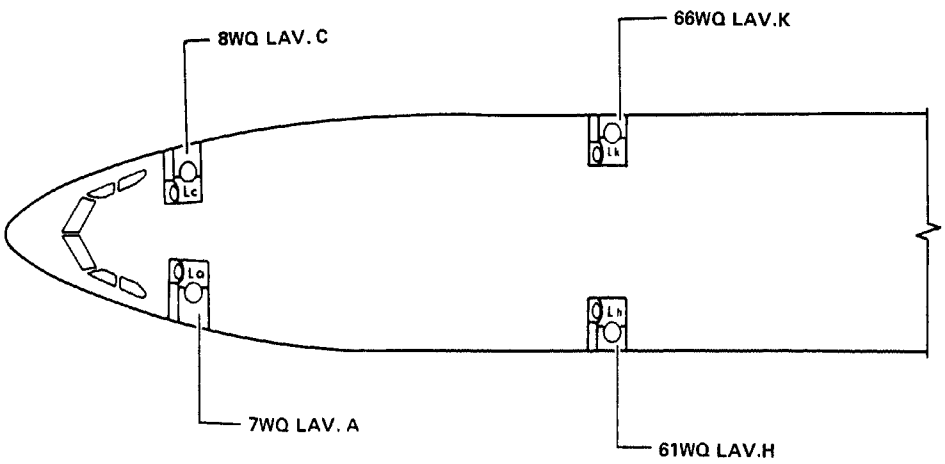


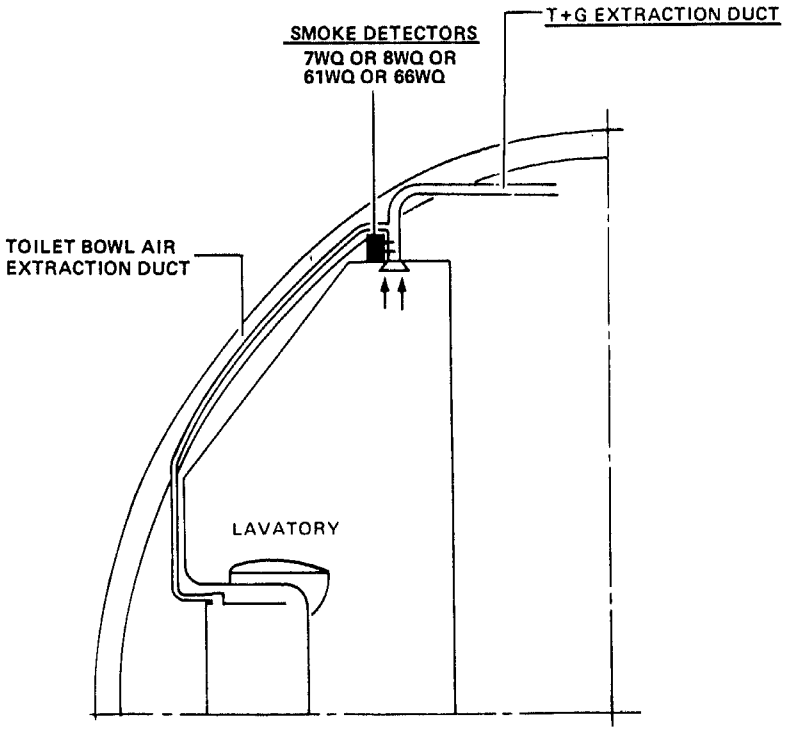




PRINCIPE SCHEME - LAVATORY

BM5 26 17 00 0 BBMO - 24

Forward Lavatory Duct Smoke Detector - Location
Figure 003

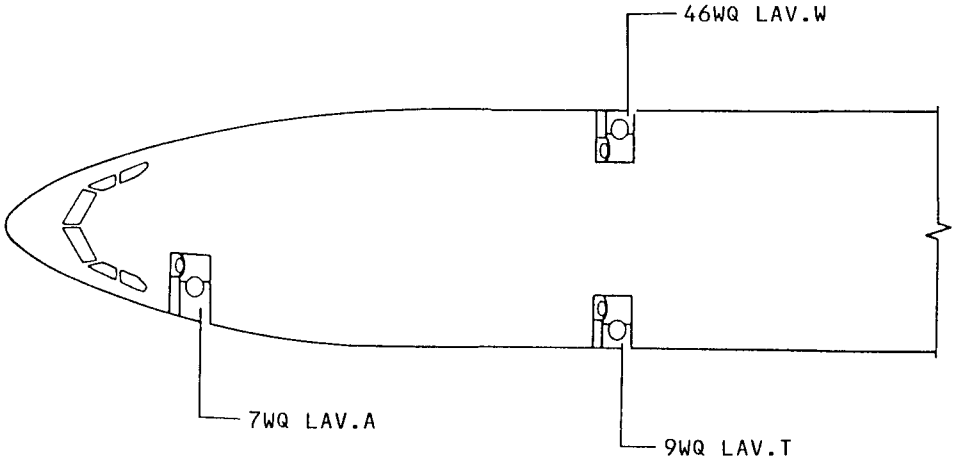


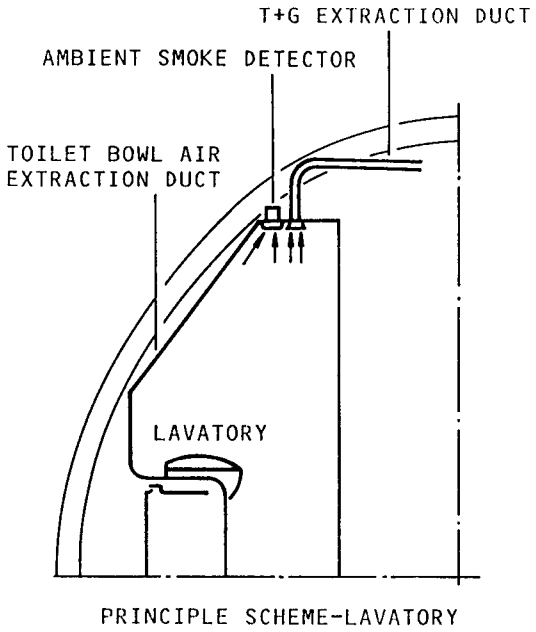




PRINCIPE SCHEME - LAVATORY

BM5 26 17 00 0 ABNO-00

Forward Lavatory Duct Smoke Detector - Location
Figure 004

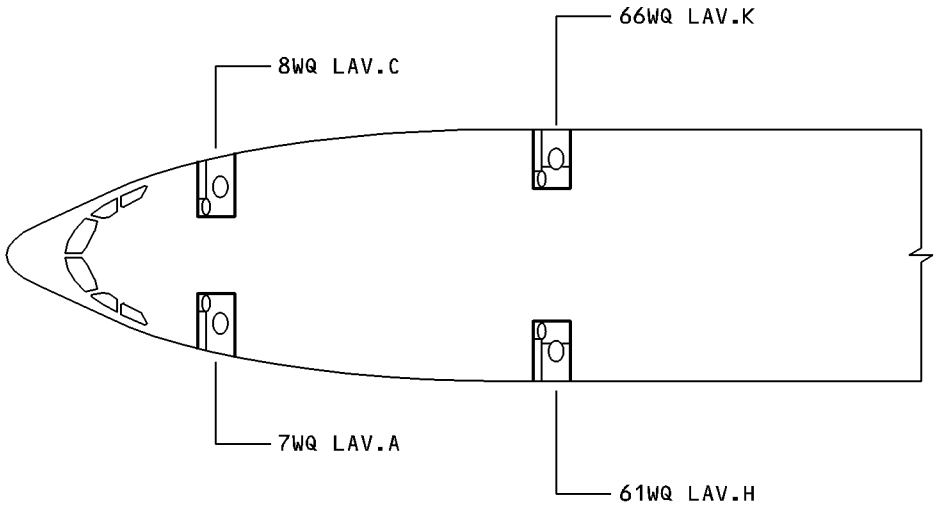


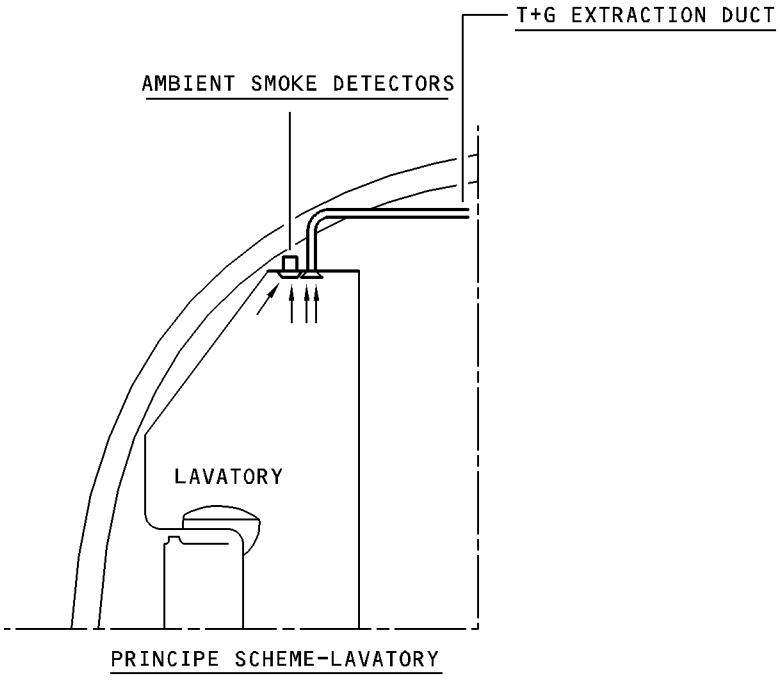




PRINCIPLE SCHEME-LAVATORY

BM6 26 17 00 0 BBRO 00

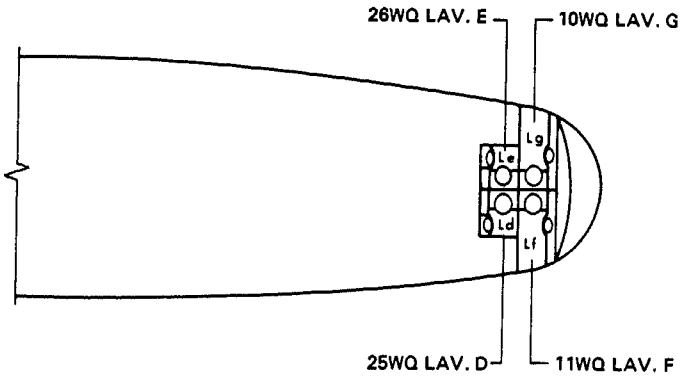
Forward Lavatory Ambient Smoke Detector - Location
Figure 005

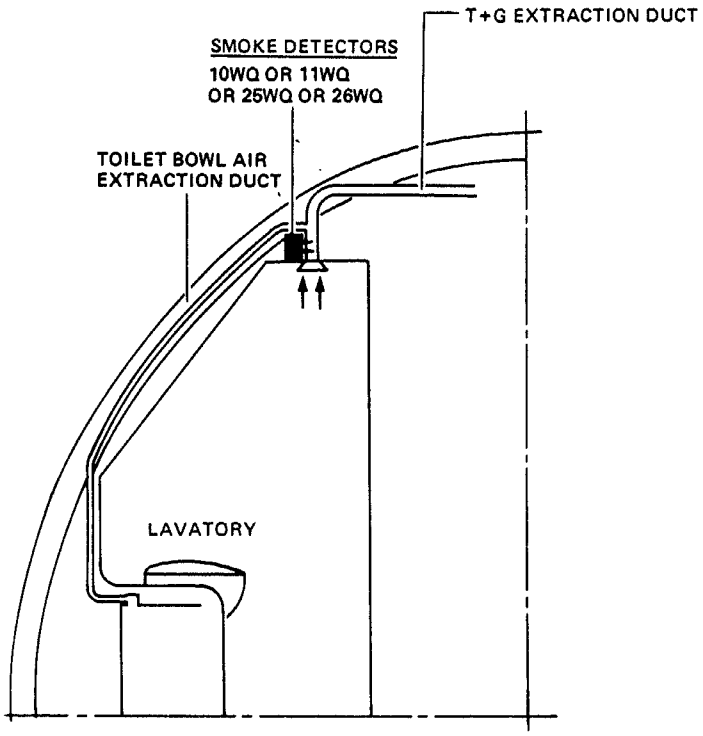



BM6 26 17 00 0 ABRO 00

Forward Lavatory Ambient Smoke Detector - Location
Figure 006

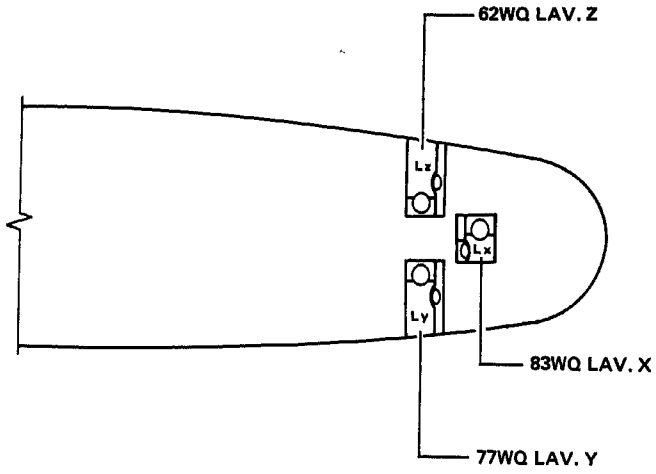


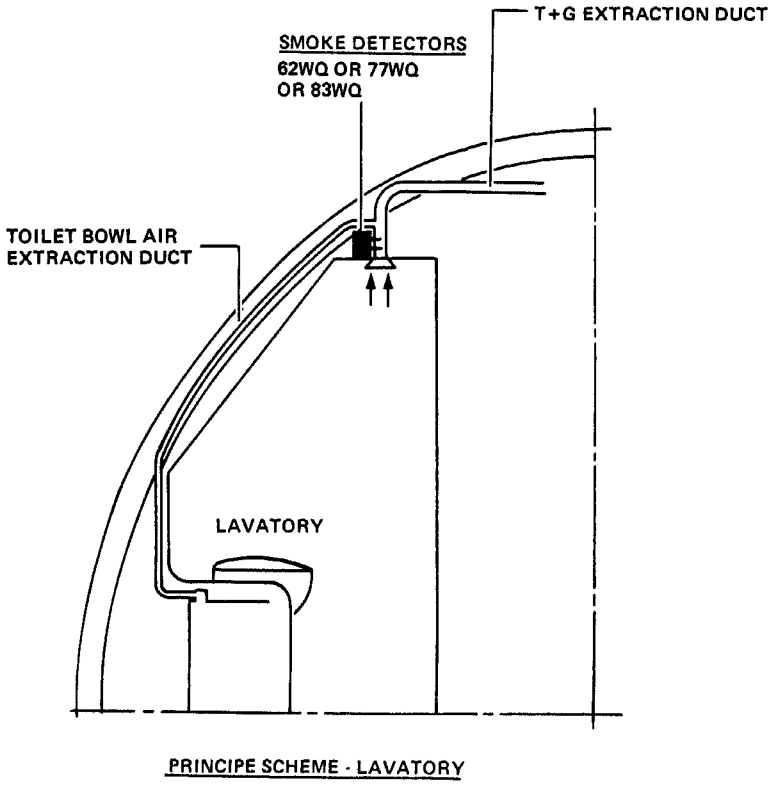




PRINCIPE SCHEME - LAVATORY

BM5 26 17 00 0 BCMO - 24

Aft Lavatory Duct Smoke Detector - Location
Figure 007




BM5 26 17 00 0 QCMO - 00

Aft Lavatory Duct Smoke Detector - Location
Figure 008

Post SB 26-2023 For A/C 001-005,

(Ref. Fig. 009)

R **ON A/C 101-104, 106-200,

Post SB 26-2023 For A/C 101-103,

(Ref. Fig. 010)

R **ON A/C 101-103, 105-105,

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 3WQ | WARNING LIGHT - SMOKE LAV | 863VU | 221 | | |
| 4WQ | P/BSW - LAV SMOKE TEST | 863VU | 221 | | |
| 5WQ | SEL SW - LAV SMOKE DET TEST | 863VU | 221 | | |
| 6WQ | WARNING LIGHT - SMOKE LAV | 866VU | 261 | | |
| 7WQ | DET - DUCT SMOKE LAVATORY A | 801VU | 221 | | 26-17-11 |
| 9WQ | DET - DUCT SMOKE LAVATORY T | 1870VU | 241 | | 26-17-11 |
| 13WQ | WARNING LIGHT - FWD LAVATORY A | 801VU | 221 | | |
| 15WQ | WARNING LIGHT - FWD LAVATORY T | 1870VU | 241 | | |
| 31WQ | RELAY - LAV SMOKE DETECT | 786VU | 234 | | |
| 44WQ | WARNING LIGHT - FWD LAVATORY W | 1871VU | 242 | | |
| 46WQ | DET - DUCT SMOKE LAVATORY W | 1871VU | 242 | | 26-17-11 |
| 60WQ | WARNING LIGHT - AFT LAVATORY Z | 1864VU | 252 | | |
| 62WQ | DET - DUCT SMOKE LAVATORY Z | 1864VU | 252 | | 26-17-11 |
| 77WQ | DET - DUCT SMOKE LAVATORY Y | 1865VU | 261 | | 26-17-11 |
| 79WQ | WARNING LIGHT - AFT LAVATORY Y | 1865VU | 261 | | |
| 83WQ | DET - DUCT SMOKE LAVATORY X | 1868VU | 260 | | 26-17-11 |
| 85WQ | WARNING LIGHT - AFT LAVATORY X | 1868VU | 260 | | |

**ON A/C 001-005,

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 3WQ | WARNING LIGHT - SMOKE LAV | 863VU | 221 | | |
| 4WQ | P/BSW - LAV SMOKE TEST | 863VU | 221 | | |
| 5WQ | SEL SW - LAV SMOKE DET TEST | 863VU | 221 | | |
| 6WQ | WARNING LIGHT - SMOKE LAV | 866VU | 261 | | |
| 7WQ | DET - DUCT SMOKE LAVATORY A | 801VU | 221 | | 26-17-11 |
| 8WQ | DET - DUCT SMOKE LAVATORY C | 763VU | 222 | | 26-17-11 |
| 10WQ | DET - DUCT SMOKE LAVATORY G | 814VU | 262 | | 26-17-11 |
| 11WQ | DET - DUCT SMOKE LAVATORY F | 815VU | 261 | | 26-17-11 |
| 12WQ | WARNING LIGHT - FWD LAVATORY C | 763VU | 222 | | |
| 13WQ | WARNING LIGHT - FWD LAVATORY A | 801VU | 221 | | |
| 16WQ | WARNING LIGHT - AFT LAVATORY G | 814VU | 262 | | |

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 17WQ | WARNING LIGHT - AFT LAVATORY F | 815VU | 261 | | |
| 25WQ | DET - DUCT SMOKE LAVATORY D | 813VU | 261 | | 26-17-11 |
| 26WQ | DET - DUCT SMOKE LAVATORY E | 812VU | 262 | | 26-17-11 |
| 27WQ | WARNING LIGHT - AFT LAVATORY D | 813VU | 261 | | |
| 28WQ | WARNING LIGHT - AFT LAVATORY E | 812VU | 262 | | |
| 31WQ | RELAY - LAV SMOKE DETECT | 786VU | 234 | | |
| 61WQ | DET - DUCT SMOKE LAVATORY H | 1862VU | 231 | | 26-17-11 |
| 63WQ | WARNING LIGHT - FWD LAVATORY H | 1862VU | 231 | | |
| 66WQ | DET - DUCT SMOKE LAVATORY K | 879VU | 232 | | 26-17-11 |
| 68WQ | WARNING LIGHT - AFT LAVATORY K | 879VU | 232 | | |

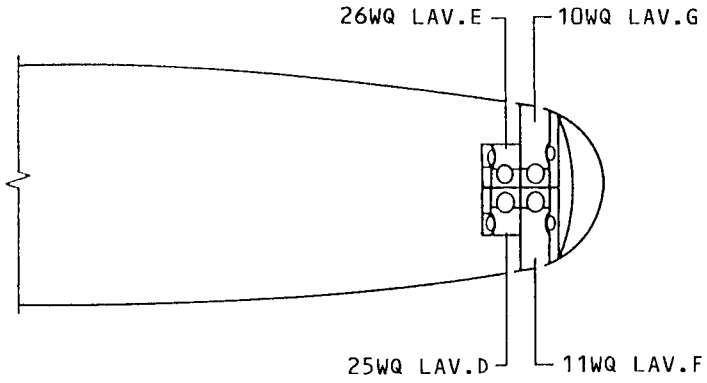
**ON A/C 001-100,

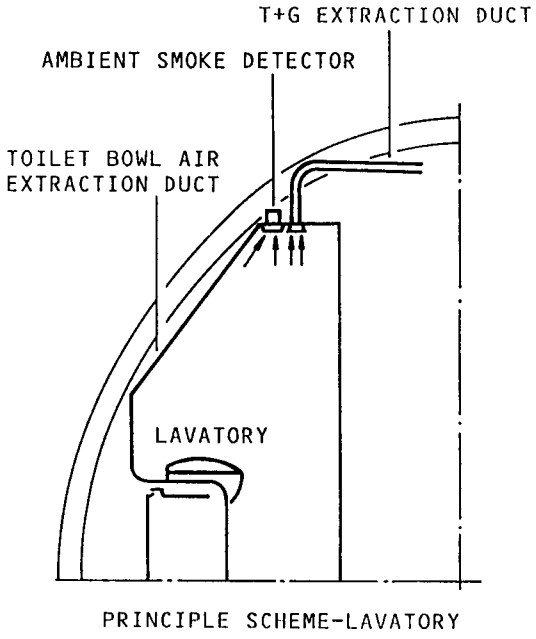
Post SB 26-2023 For A/C 001-005,

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 3WQ | WARNING LIGHT - SMOKE LAV | 863VU | 221 | | |
| 4WQ | P/BSW - LAV SMOKE TEST | 863VU | 221 | | |
| 5WQ | SEL SW - LAV SMOKE DET TEST | 863VU | 221 | | |
| 6WQ | WARNING LIGHT - SMOKE LAV | 866VU | 261 | | |
| 7WQ | DET - AMBIENT SMOKE LAVATORY A | 801VU | 221 | | 26-17-11 |
| 8WQ | DET - AMBIENT SMOKE LAVATORY C | 763VU | 222 | | 26-17-11 |
| 10WQ | DET - AMBIENT SMOKE LAVATORY G | 814VU | 262 | | 26-17-11 |
| 11WQ | DET - AMBIENT SMOKE LAVATORY F | 815VU | 261 | | 26-17-11 |
| 12WQ | WARNING LIGHT - FWD LAVATORY C | 763VU | 222 | | |
| 13WQ | WARNING LIGHT - FWD LAVATORY A | 801VU | 221 | | |
| 16WQ | WARNING LIGHT - AFT LAVATORY G | 814VU | 262 | | |
| 17WQ | WARNING LIGHT - AFT LAVATORY F | 815VU | 261 | | |
| 25WQ | DET - AMBIENT SMOKE LAVATORY D | 813VU | 261 | | 26-17-11 |
| 26WQ | DET - AMBIENT SMOKE LAVATORY E | 812VU | 262 | | 26-17-11 |
| 27WQ | WARNING LIGHT - AFT LAVATORY D | 813VU | 261 | | |
| 28WQ | WARNING LIGHT - AFT LAVATORY E | 812VU | 262 | | |
| 31WQ | RELAY - LAV SMOKE DETECT | 786VU | 234 | | |
| 61WQ | DET - AMBIENT SMOKE LAVATORY H | 1862VU | 231 | | 26-17-11 |
| 63WQ | WARNING LIGHT - FWD LAVATORY H | 1862VU | 231 | | |
| 66WQ | DET - AMBIENT SMOKE LAVATORY K | 879VU | 232 | | 26-17-11 |
| 68WQ | WARNING LIGHT - AFT LAVATORY K | 879VU | 232 | | |

R **ON A/C 101-104, 106-200,

Post SB 26-2023 For A/C 101-103,

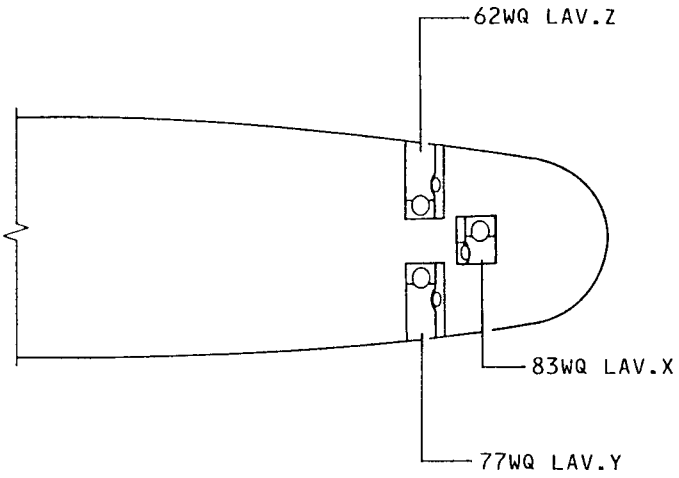


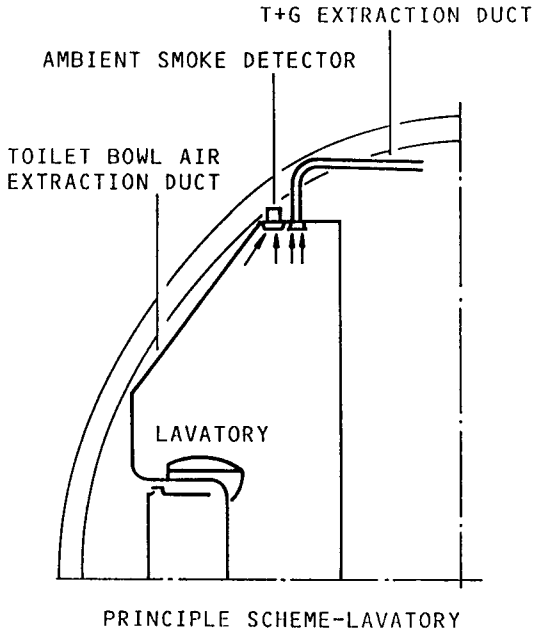




PRINCIPLE SCHEME-LAVATORY

BM6 26 17 00 0 BCR0 00

Aft Lavatory Ambient Smoke Detector - Location
Figure 009




PRINCIPLE SCHEME-LAVATORY

BM6 26 17 00 0 QCRO 00

Aft Lavatory Ambient Smoke Detector - Location
Figure 010

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 3WQ | WARNING LIGHT - SMOKE LAV | 863VU | 221 | | |
| 4WQ | P/BSW - LAV SMOKE TEST | 863VU | 221 | | |
| 5WQ | SEL SW - LAV SMOKE DET TEST | 863VU | 221 | | |
| 6WQ | WARNING LIGHT - SMOKE LAV | 866VU | 261 | | |
| 7WQ | DET - AMBIENT SMOKE LAVATORY A | 801VU | 221 | | 26-17-11 |
| 9WQ | DET - AMBIENT SMOKE LAVATORY T | 1870VU | 241 | | 26-17-11 |
| 13WQ | WARNING LIGHT - FWD LAVATORY A | 801VU | 221 | | |
| 15WQ | WARNING LIGHT - FWD LAVATORY T | 1870VU | 241 | | |
| 31WQ | RELAY - LAV SMOKE DETECT | 786VU | 234 | | |
| 44WQ | WARNING LIGHT - FWD LAVATORY W | 1871VU | 242 | | |
| 46WQ | DET - AMBIENT SMOKE LAVATORY W | 1871VU | 242 | | 26-17-11 |
| 60WQ | WARNING LIGHT - AFT LAVATORY Z | 1864VU | 252 | | |
| 62WQ | DET - AMBIENT SMOKE LAVATORY Z | 1864VU | 252 | | 26-17-11 |
| 77WQ | DET - AMBIENT SMOKE LAVATORY Y | 1865VU | 261 | | 26-17-11 |
| 79WQ | WARNING LIGHT - AFT LAVATORY Y | 1865VU | 261 | | |
| 83WQ | DET - AMBIENT SMOKE LAVATORY X | 1868VU | 260 | | 26-17-11 |
| 85WQ | WARNING LIGHT - AFT LAVATORY X | 1868VU | 260 | | |

R **ON A/C 001-005, 101-103, 105-105,

3. Description

A. Principle
Detection is carried out by duct smoke detectors which are of the ionization or optical type with a system operating principle identical to that used for the electrical and electronics equipment (Ref. Fig. 011).

R **ON A/C 001-104, 106-200,

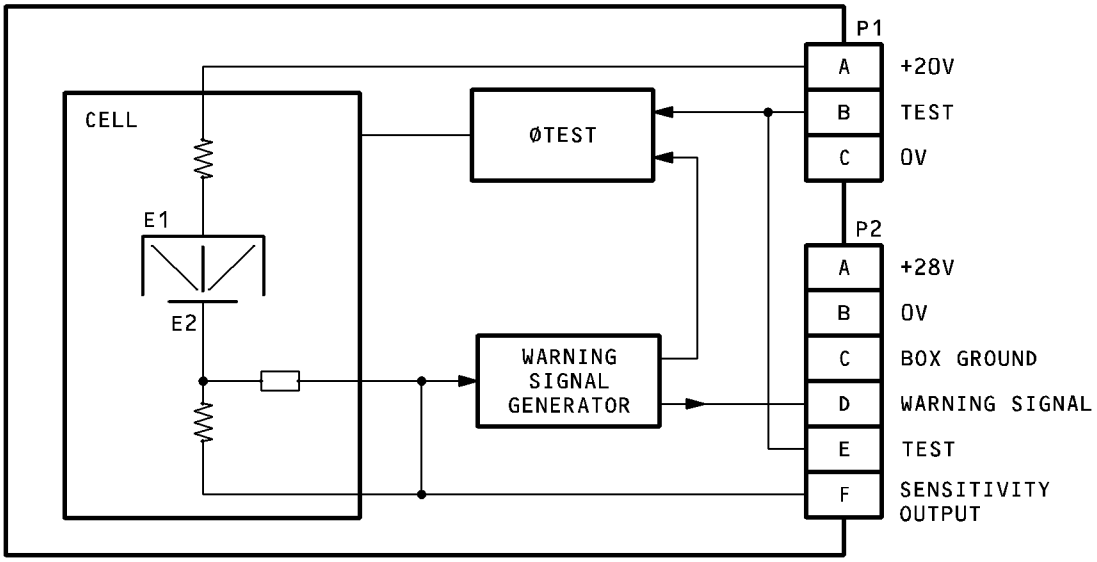
Post SB 26-2023 For A/C 001-005,101-103,

3. Description

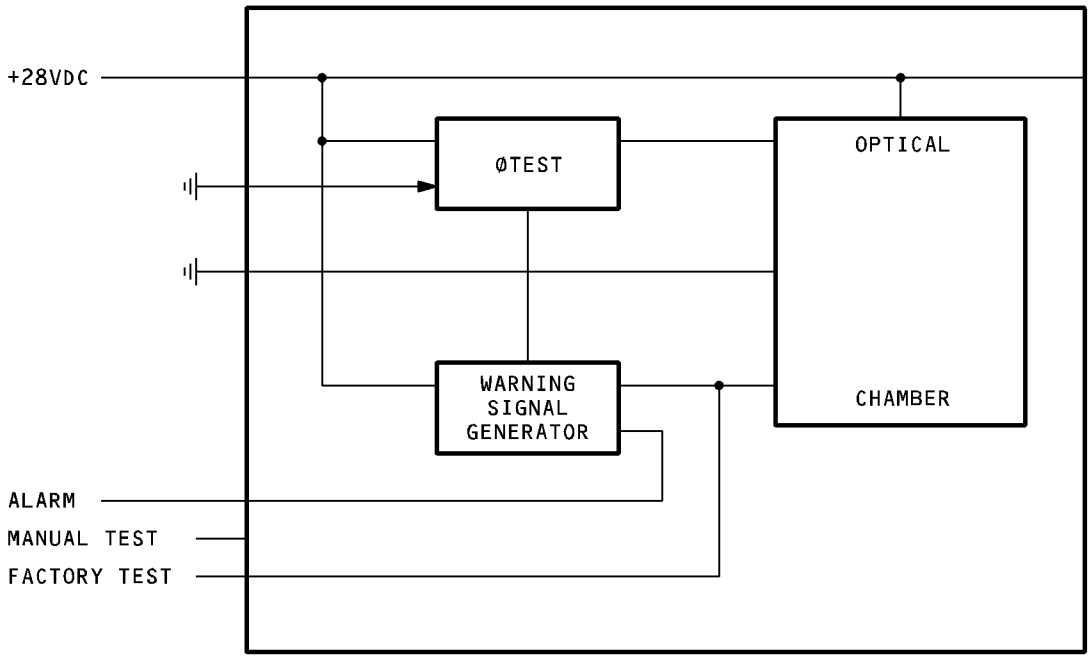
A. Principle
Detection is carried out by a ambient smoke detector which is of the ionization type with a system operating principle identical to that used for the elctrical and electronics equipment (Ref. Fig. 012).

**ON A/C ALL

B. Detection System Components
(1)Ionization type duct and ambient smoke detectors
(a)The detectors are of the "ionization" type and are made up of :



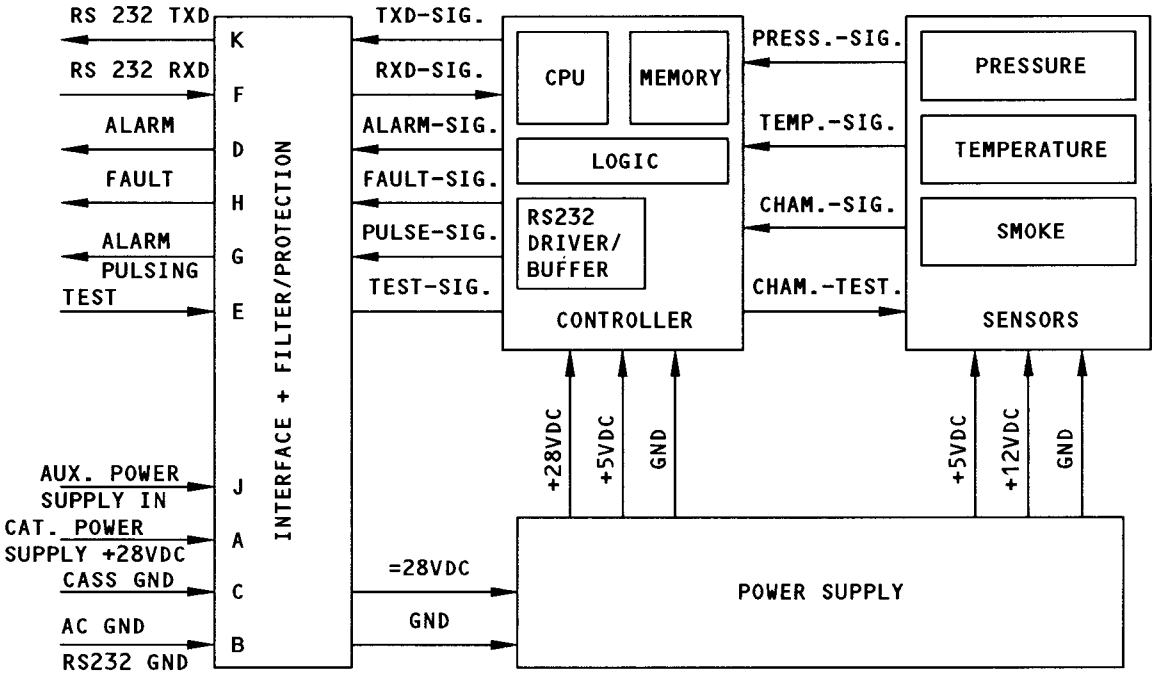

IONIZATION-TYPE DUCT SMOKE-DETECTOR




OPTICAL-TYPE DUCT SMOKE-DETECTOR

BM6 26 17 00 0 AAB0 01

Duct Smoke Detector - Schematic
Figure 011




BM6 26 17 00 0 AAC0 00

Ambient Smoke Detector - Schematic
Figure 012

- a measurement chamber through which the air to be analyzed passes
- a reference resistor.

(b)The chamber is ionized by an extremly weak radioactive source.

(c)When penetrating the detector, the air loaded with smoke modifies the balance between the resistor and the ionization chamber, which results in a variation of the detector rest voltage.

(d)The detectors are "self-contained" that means that they are directly connected (without an intermediate electronic unit) to the flight compartment.

(e)From a setting threshold of the measurement chamber voltage, the electronic circuit inside the detector transmits a signal which directly causes the corresponding warning in the Pursers station, on attendant's panel and in each lavatory.

(f)The detectors comprise 2 electrical connectors each. In this installation, connector "A" only has to be used.

(g)The duct smoke detectors are installed in the ceiling of each lavatory at the air extraction duct.

(h)The ambient smoke detectors are installed in the ceiling of each lavatory at the air outlet hood.

(2)Optical type duct smoke detectors

(a)The heart of the smoke detector is a high quality optical measurement chamber that screens external parasite light but optimally detects light colored and dark smoke particles. The smoke detection is based on the scattered light principle.

(b)The light source (IR LED), the light trap (or light stop) and the light receiver are arranged in such a way that the light from the emitter cannot directly reach the receiver. Only when smoke particles are present in the optical path, some of the scattered light reaches the photoreceiver and produces an electrical signal. A sophisticated labyrinth enables the light trap to be efficient and react to false alarms such as parasite light.

(c)Brief light pulses (100 us) are transmitted periodically by the IR LED into the scattering chamber.

(d)The wavelength of the light is 800 nm (near infrared) in order to optimise the detection efficiency.

(e)Finally, the photodiode receives scattered light and converts it into an electrical signal, to be processed by the electronics.

(f)The detectors comprise 2 electrical connectors each. In this installation, connector "A" only has to be used.

(g)The smoke detectors are installed in the ceiling of each lavatory at the air extraction duct.

C. Monitoring and Indicating Assembly

(1)On Purser panel 863VU are located

- a SMOKE LAV DET selector switch.
- a SMOKE LAV TEST pushbutton switch.
- a red SMOKE LAV warning light.

(2)On each lavatory wall is located one red warning light.

(3)On aft Attendant's panel 866VU is located one red SMOKE LAV warning light.

(4)On all area call panels is a red warning light located.

4. Operation

A. Operation in Warning Configuration
(1)Operation of lavatory smoke detectors is identical to that of avionics compartment.
(2)In case of smoke
(a)The corresponding red warning light on lavatory wall comes on.
NOTE : The corresponding red warning light will turn off automatically when the smoke disappear.

B. Operation in Test Configuration
(1)Smoke detector checks are carried out by placing the SMOKE LAV DET selector switch located on Purser's panel (863VU) in the detection circuit position to be checked and by pressing SMOKE LAV TEST pushbutton switch (Ref. 26-17-00, P. Block 501).

1. Operational Test

A. Reason for the Job
Check of correct operation of warnings associated with smoke detection system power supplies.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedures | |
| - 23-43-00, P. Block 1 | Cabin and Flight Crew Call System |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 21-27-00, P. Block 701 | Lavatory Extraction Duct Cleaning |

C. Procedure
(1)Job set-up
(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that electronics racks ventilation is correct.
(c)Make certain that the following cicuit breaker is closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | SMOKE DET LAV | 1WQ | E51 |

NOTE : The smoke detection warning lights for the FWD and MID lavatories are on panel 863VU.
The smoke detection warning lights for the AFT lavatories are on panel 866VU.

(2)Test

| ACTION | RESULT |
|---|---|
| (a)On panel 863VU (866VU):<br>1 Press SMOKE LAV pushbutton. | On panel 863VU (866VU):<br>- Red light in the SMOKE LAV pushbutton comes on. |
| (b)On panel 863VU :<br>1 Rotate SMOKE LAV DET selector switch (5WQ) from NORM FLT to any lavatory symbol. | On panel 863VU :<br>- SMOKE LAV TEST legend of pushbutton switch (4WQ) comes on. |
| R **ON A/C 001-005, 101-103, 105-105,<br>2 Press and hold SMOKE LAV TEST pushbutton switch (4WQ). | In the cabin:<br>- Area red call lights come on.<br>- HI-LOW-TONE sounds.<br>- Red light in the pushbutton on |

| ACTION | RESULT |
|---|---|
| | the outside of the respective lavatory wall comes on.<br>On panel 863VU (866VU):<br>- Red light in SMOKE LAV comes on.<br>On all attendant call stations:<br>- White CAPT CALL lights come on.<br>- Green lights of the cabin call buttons come on. |
| R **ON A/C 001-104, 106-200, | |
| Post SB 26-2023 For A/C 001-005,101-103, | |
| 2 Press and hold SMOKE LAV TEST pushbutton switch (4WQ) for at least 6,5 sec. | In the cabin:<br>- Area red call lights come on.<br>- HI-LOW-TONE sounds.<br>- Red light in the pushbutton on the outside of the respective lavatory wall comes on.<br>On panel 863VU (866VU):<br>- Red light in SMOKE LAV comes on.<br>On all attendant call stations:<br>- White CAPT CALL lights come on.<br>- Green lights of the cabin call buttons come on. |
| **ON A/C ALL | |
| 3 Release SMOKE LAV TEST push-button switch (4WQ). | In the cabin:<br>- Red light in the pushbutton on the outside of the respective lavatory wall goes off.<br>On panel 863VU (866VU):<br>- Red light in SMOKE LAV pushbutton goes off. |
| (c)On any attendant/purser call station.<br>- Lift and replace interphone headset. | On all attendant/purser call stations:<br>- White CAPT CALL lights go off<br>- Green lights of the cabin call buttons go off.<br>In the cabin:<br>- Area red call lights go off. |

| ACTION | RESULT |
|---|---|
| (d)Repeat actions a), b) and c) described above, placing test selector switch (5WQ) to the next lavatory symbol depending on the smoke | Results are the same as described in the steps above. |
| (e)On panel 863VU:<br>- Rotate SMOKE LAV DET selector switch (5WQ) in NORM FLT position. | On panel 863VU:<br>- SMOKE LAV TEST legend of push-button switch (4WQ) goes off. |

2. Functional Test

WARNING : MAKE SURE THAT YOU HAVE THE CORRECT FIRE FIGHTING EQUIPMENT AVAILABLE.

R WARNING : THE SPRAY IS VERY COLD, THEREFORE SUITABLE PROTECTIVE GLOVES
R SHOULD BE USED WHEN USING SPRAY.

A. Reason for the Job

To provide a functional test for each lavatory smoke detector.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1)FAA Powder | (Potassium Chlorate/Lactose) 1.6 g per toilet |
| (2)Kleenex Tissues | 1 Box |
| R (3)Material No. 19-023 | REF 8-S Test Gas with Test Device (Sleeve) RE6 |
| R | (Ref. 20-31-00) |

Referenced Procedures

| | |
|---|---|
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 21-27-00, P. Block 701 | Lavatory Extraction Duct Cleaning |

C. Procedure

(1)Job set-up

(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Make certain that electronics racks ventilation is correct.

(2)Test with FAA powder

Place 1.6 g of FAA powder in a suitable receptacle (metal ashtray etc.) on the floor of respective toilet and ignite with a naked flame. Close door and within 1 minute smoke warning must activate

- Repeat process for each toilet.

If warning does not activate within 1 minute clean smoke detector ducting (Ref. 21-27-00, P. Block 701) and repeat test.

(3)Test with kleenex tissues (as alternative)

Make a ball from three kleenex tissues (diameter approx. 80 mm (3.14 in.).

Put it in a suitable receptacle (metal ashtray etc...) on the floor of respective toilet and ignite with a naked flame.
Close door and within 1 minute smoke warning must activate.
- Repeat process for each toilet.
If warning does not activate within 1 minute clean smoke detector ducting (Ref. 21-27-00, P. Block 701) and repeat test.

R (4)Test with Material No. 19-023 (as alternative)

R WARNING : THE SPRAY IS VERY COLD, THEREFORE SUITABLE PROTECTIVE
R GLOVES SHOULD BE WORN WHEN USING SPRAY.

R WARNING : CONSIDER THE SAFETY INSTRUCTIONS OF THE TEST SPRAY.

R (a)Spray 3 or 4 short sprays of the test spray (Material No. 19-023)
R into the intake of the lavatory smoke detector system.

R NOTE : It is recommended that the test spray is used with the
R "Test Device (SLEEVE) RE 6".

R NOTE : The spray time should not exceed 0,5 sec. to avoid freezing
R inside the smoke detector. A minimum time of 1 sec. between
R each spray is acceptable.

R (b)Make sure that the smoke detection system is activated with the
R appropriate warning. If the warning does not activate within
R 10 seconds, clean the smoke detector ducting (Ref. 21-27-00,
R P. Block 701).
R (c)Repeat steps (a) and (b) as necessary.

(5)Close-up
(a)De-energize the aircraft network (Ref. 24-41-00, P. Block 301).
(b)Restore system and aircraft to normal operating condition.

# LAVATORY SMOKE DETECTION - CLEANING/PAINTING

## 1. Reason for the Job

Cleaning of the ionized smoke detector air duct.

## 2. Referenced Procedures

| | |
|---|---|
| - 26-17-11, P. Block 401 | Smoke Detector |
| - 26-17-11, P. Block 501 | Lavatory Smoke Detection |
| - 21-27-00, P. Block 701 | Lavatory and Galley Ventilation |

## 3. Procedure

A. Job Set-up
(1)Get access to the related lavatory.
(2)Open the lavatory door.

B. Cleaning of the smoke detector air duct.
(1)Remove the lavatory smoke detector (Ref. 26-17-11, P. Block 401).
(2)Clean the smoke detector air duct (Ref. 21-27-00, P. Block 701).
(3)Install the lavatory smoke detector (Ref. 26-17-11, P. Block 401).
(4)Do the operational test of the lavatory smoke detector (Ref. 26-17-00, P. Block 501).

C. Close-up
(1)Make sure that the work area is clean and clear of tools and other items.
(2)Close the lavatory door.

Ref. MMEL Sect. 26-25-01, Item C (FAA only)

1. Deactivation

A. Reason for the Job
This procedure is required prior to permitting dispatch with an inoperative lavatory fire extinguisher system.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Placard:- INOPERATIVE - DO NOT ENTER |
| (2) | Placard:- Lavatory is not used for any purpose |

| Referenced Procedure | |
|---|---|
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 26-17-00, P. Block 501 | Lavatory Smoke Detector |

C. Procedure
(1)Job set-up
(a)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)For each Lavatory, the Lavatory Fire Extinguisher System may be inoperative provided:
(a)Lavatory Smoke Detector System operates normally (Ref.26-17-00, P.Block 501)
- OR -
(3)Deactivation
(a)Lavatory Waste Receptacle is empty,
(b)Lavatory Door is locked closed and placarded:
- INOPERATIVE - DO NOT ENTER
- Lavatory is not used for any purpose
NOTE : These provisions are not intended to prohibit lavatory inspections by crew members.
NOTE : A Lavatory Fire Extinguisher System is not required for All Cargo operations.
(4)Close-Up
(a)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).

2. Reactivation

A. Reason for the Job
This procedure is required to restore the Lavatory in the normal condition.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Lavatory Fire Extinguisher System |

Referenced Procedure
- 24-41-00, P. Block 301 — AC External Power Control
- 26-17-00, P. Block 501 — Lavatory Smoke Detector

C. Procedure
(1)Job set-up
(a)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)Reactivation
(a)Install in each lavatory a Fire Extinguisher System.
(b)From all placarded Lavatory Doors, remove placards
- **INOPERATIVE - DO NOT ENTER**
- Lavatory is not used for any purpose
(3)Test
(a)Carry out Lavatory Smoke Detector Test (Ref. 26-17-00, P. Block 501).
(4)Close-Up
(a)De-energize the aircraft electrical network and disconnect electrical ground power unit.

SMOKE DETECTOR - REMOVAL/INSTALLATION

WARNING : SMOKE DETECTORS CONTAIN RADIOACTIVE CHEMICAL - AMERICIUM 241 - OF APPROXIMATELY 0.4 MICRO CURIES.

CAUTION : MAKE SURE THAT THE AIR EXTRACTION GRILL, THE SMOKE DETECTOR AND THE AIR EXTRACTION DUCT ARE IN LINE WITH THE EXTRACTION AIRFLOW. INCORRECT INSTALLATION CAN CAUSE MALFUNCTION OF THE SMOKE DETECTOR, IF FITTED.

R **ON A/C 001-005, 101-103, 105-105,

SMOKE DETECTOR - REMOVAL/INSTALLATION

WARNING : SMOKE DETECTORS CONTAIN RADIOACTIVE CHEMICAL - AMERICIUM 241 - OF APPROXIMATELY 0.4 MICRO CURIES.

**ON A/C ALL

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Blanking Caps |
| B. | Circuit Breaker Safety Clip |
| C. | Sealing Rings |

R **ON A/C 001-005, 101-103, 105-105,

Referenced Procedures
- 21-27-00, P. Block 701 Lavatory and Galley Ventilation
- 25-40-00, P. Block 1 Lavatories
- 25-23-13, P. Block 401 Utility Area Ceiling Panels
- 26-17-00, P. Block 501 Lavatory Smoke Detection

R

R **ON A/C 001-104, 106-200,

Post SB 26-2023 For A/C 001-005,101-103,

Referenced Procedures
- 21-27-00, P. Block 701 Lavatory and Galley Ventilation
- 25-23-13, P. Block 401 Utility Area Ceiling Panels
- 26-17-00, P. Block 501 Lavatory Smoke Detection

R

R **ON A/C ALL

R 2. Procedure

R **ON A/C 001-005, 101-103, 105-105,

(Ref. Fig. 401)

R **ON A/C 001-104, 106-200,

Post SB 26-2023 For A/C 001-005,101-103,

(Ref. Fig. 402)

**ON A/C ALL

A. Job Set-Up
(1)Open, safety and tag the following circuit breaker:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | SMOKE DET LAV | 1WQ | E51 |

(2)Open lavatory ceiling access panel.

R

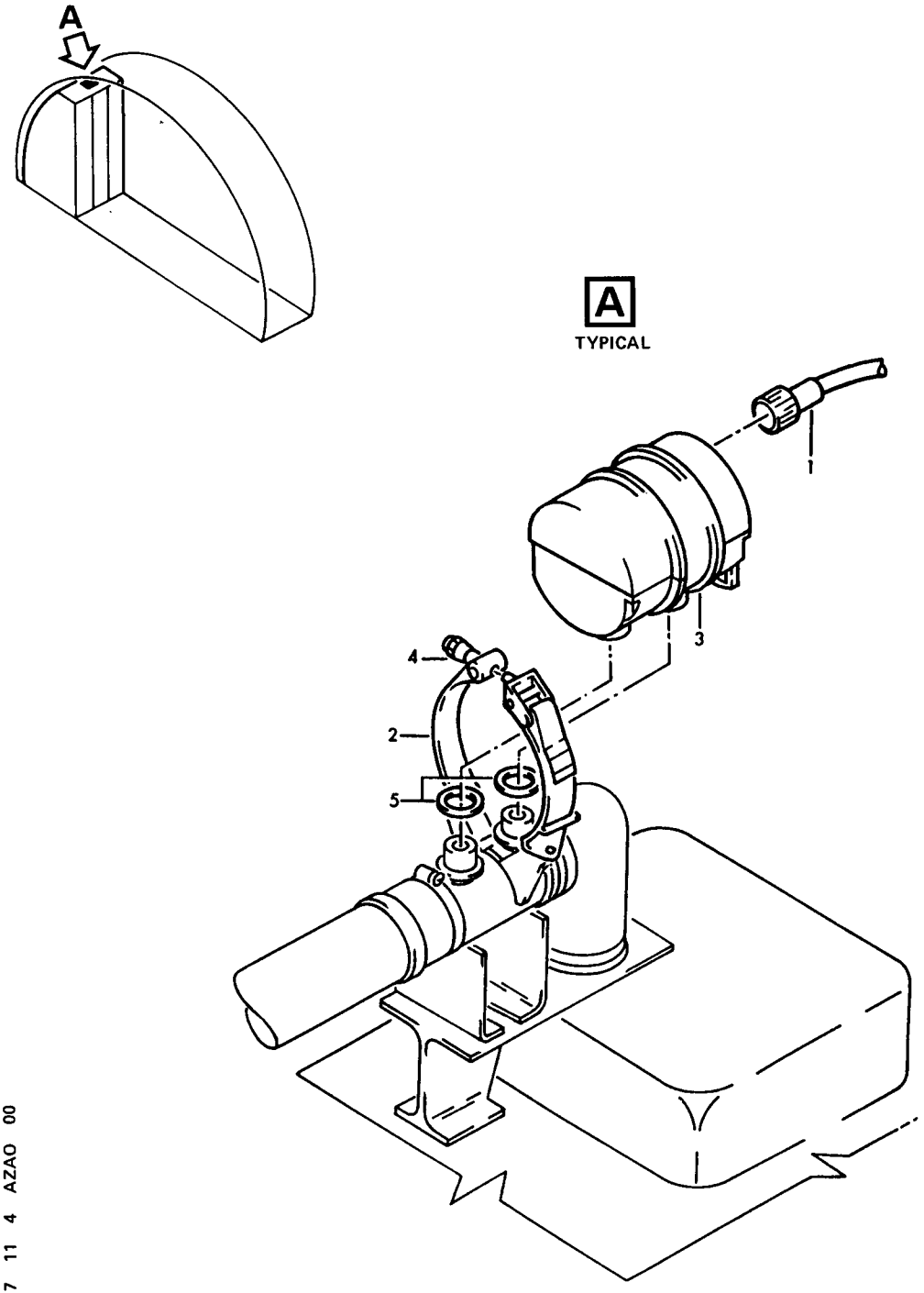
R B. Removal
NOTE : For lavatory A, the following must be removed:
Utility area ceiling panel (Ref. 25-23-13, P. Block 401, remove decor panel only).

**ON A/C 001-100,

NOTE : For lavatory C, the following must be removed:
Utility area ceiling panels (Ref. 25-23-13, P. Block 401)
For a better access to the smoke detector, remove flexible extraction hoses at the connections to the lavatory and galley extraction duct.

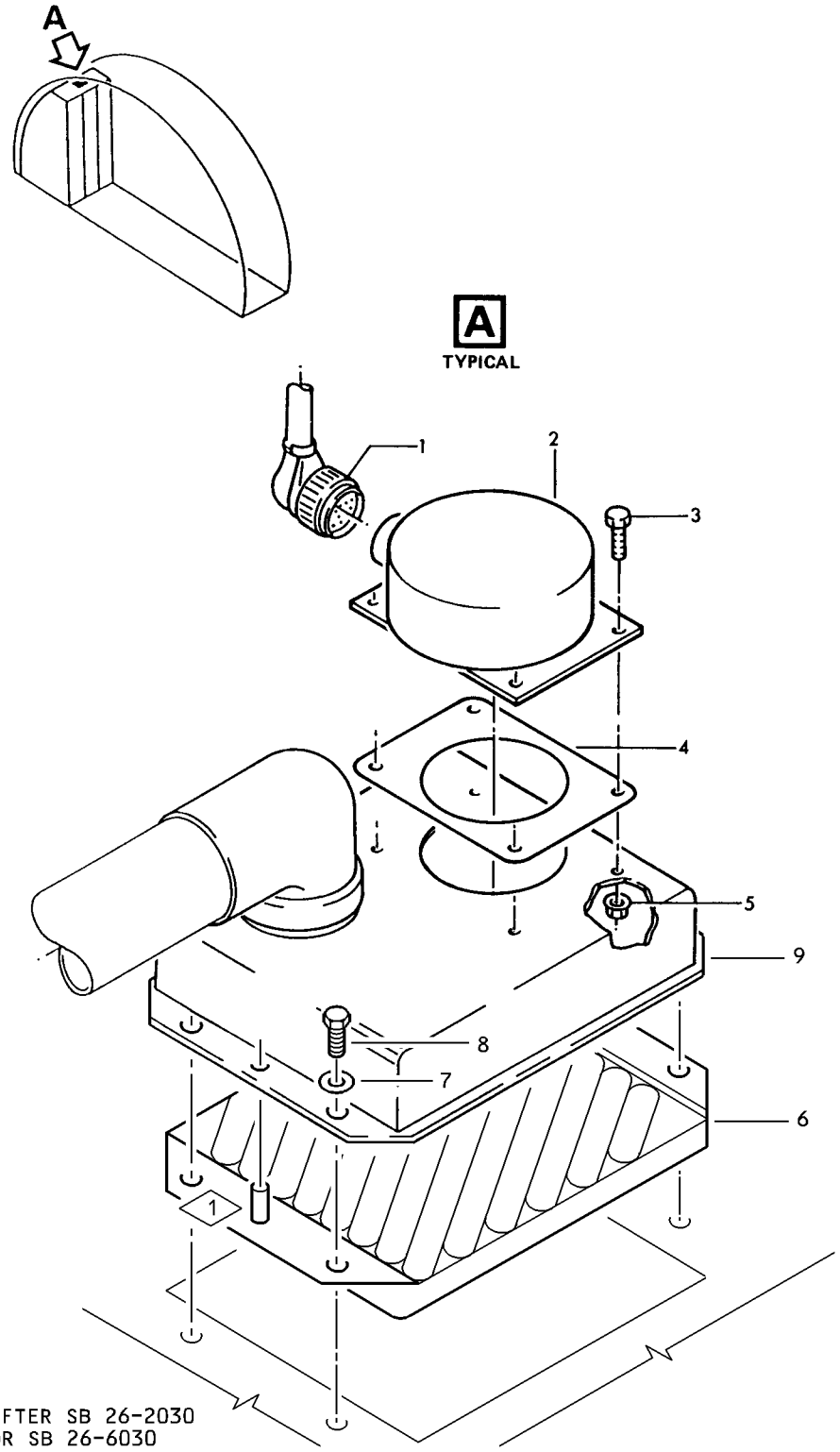
R **ON A/C 001-005, 101-103, 105-105,

NOTE : For easier installation, mark installation position of smoke detector on lavatory air duct.
(1)Disconnect and cap electrical connector (1).
(2)Loosen locknut (4) until detector attachment clamp (2) is completely free.
(3)Remove detector (3).
(4)Remove and discard sealing rings (5).




BM6 26 17 11 4 AZAO 00

Lavatory Duct Smoke Detector
Figure 401




Lavatory Ambient Smoke Detector
Figure 402

R **ON A/C 001-104, 106-200,

Post SB 26-2023 For A/C 001-005,101-103,

(1)Disconnect and cap electrical connector (1).
(2)Remove screws (8), washers (7) and louver (6).
(3)Remove screws (3) and nuts (5).
(4)Remove smoke detector (2) and sealing (4).
Discard sealing.

**ON A/C ALL

C. Preparation for Installation
(1)Clean the lavatory air extraction duct (Ref. 21-27-00, P. Block 701).
(2)Remove blanking caps from replacement component.
(3)Check bonding for serviceability.

D. Installation

R **ON A/C 001-005, 101-103, 105-105,

(1)Install new sealing rings (5).
(2)Position smoke detector (3) on detector attachment clamp (2) and tighten locknut (4).
NOTE : The installation position of the smoke detector is shown in the removal/installation procedure of the relevant lavatory (Ref. 25-40-00, P. Block 1, Para. 2., Component Location).
(3)Connect electrical connector (1).
(4)Remove safety clips and tags and close circuit breaker 1WQ.

R **ON A/C 001-104, 106-200,

Post SB 26-2023 For A/C 001-005,101-103,

(1)Install new sealing (4).
(2)Position smoke detector (2), install screws (3) and nuts (5).
(3)Place hood (9) in installation area, connect louver (6) and install washers (7) and screws (8).
NOTE : The guide pin, attached on the louver (6), must be in the line with the hole in the hood (9).

(4)Remove cap and connect electrical connector (1)

**ON A/C 001-100,

(5)Install flexible extraction hoses on lavatory and galley extraction duct.

R **ON A/C 006-100, 104-104, 106-200,

E. Test
(1)Carry out operational test of relevant smoke detector (Ref. 26-17-00, P. Block 501).

F. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

CAUTION : MAKE SURE THAT THE AIR EXTRACTION GRILL, THE SMOKE DETECTOR AND THE AIR EXTRACTION DUCT ARE IN LINE WITH THE EXTRACTION AIRFLOW. INCORRECT INSTALLATION CAN CAUSE MALFUNCTION OF THE SMOKE DETECTOR, IF FITTED.

(2)Check installation of air extraction grill.
(3)Close lavatory ceiling access panel.

R **ON A/C 001-005, 101-103, 105-105,

E. Test
(1)Carry out operational test of relevant smoke detector (Ref. 26-17-00, P. Block 501).

F. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Check installation of air extraction grill.
(3)Close lavatory ceiling access panel.

**ON A/C ALL

NOTE : For lavatory A, the following must be installed:
Utility area ceiling panel (Ref. 25-23-13, P. Block 401).

**ON A/C 001-100,

NOTE : For lavatory C, the following must be installed:
Utility area ceiling panels (Ref. 25-23-13, P. Block 401).

1. Engine fire Extinguishing (Ref. 26-21-00)

R **ON A/C 001-100,

(Ref. Fig. 001)

R **ON A/C 101-200,

(Ref. Fig. 002)

R **ON A/C ALL

Each engine is fitted with an extinguishing circuit comprising :
- Two container bottles filled with pressurized extinguishing fluid
- One discharge head fitted with a discharge cartridge for each bottle
- Lines leading to nozzles with spray extinguishing fluid in the protected zones
- Aural and visual indications for the crew. Percussion of bottles is controlled from the flight compartment

2. APU Fire Extinguishing (Ref. 26-22-00)

(Ref. Fig. 003)
One fire extinguisher bottle located adjacent to the forward firewall of the APU compartment is used to extinguish fire in the APU compartment.
One discharge head with a discharge cartridge is fitted on the bottle.
In flight, the APU extinguishing system is manually activated and on the ground it is automatically activated.

3. Cargo Compartment Fire Extinguishing (Ref. 26-23-00)

R **ON A/C 101-200,

(Ref. Fig. 004)

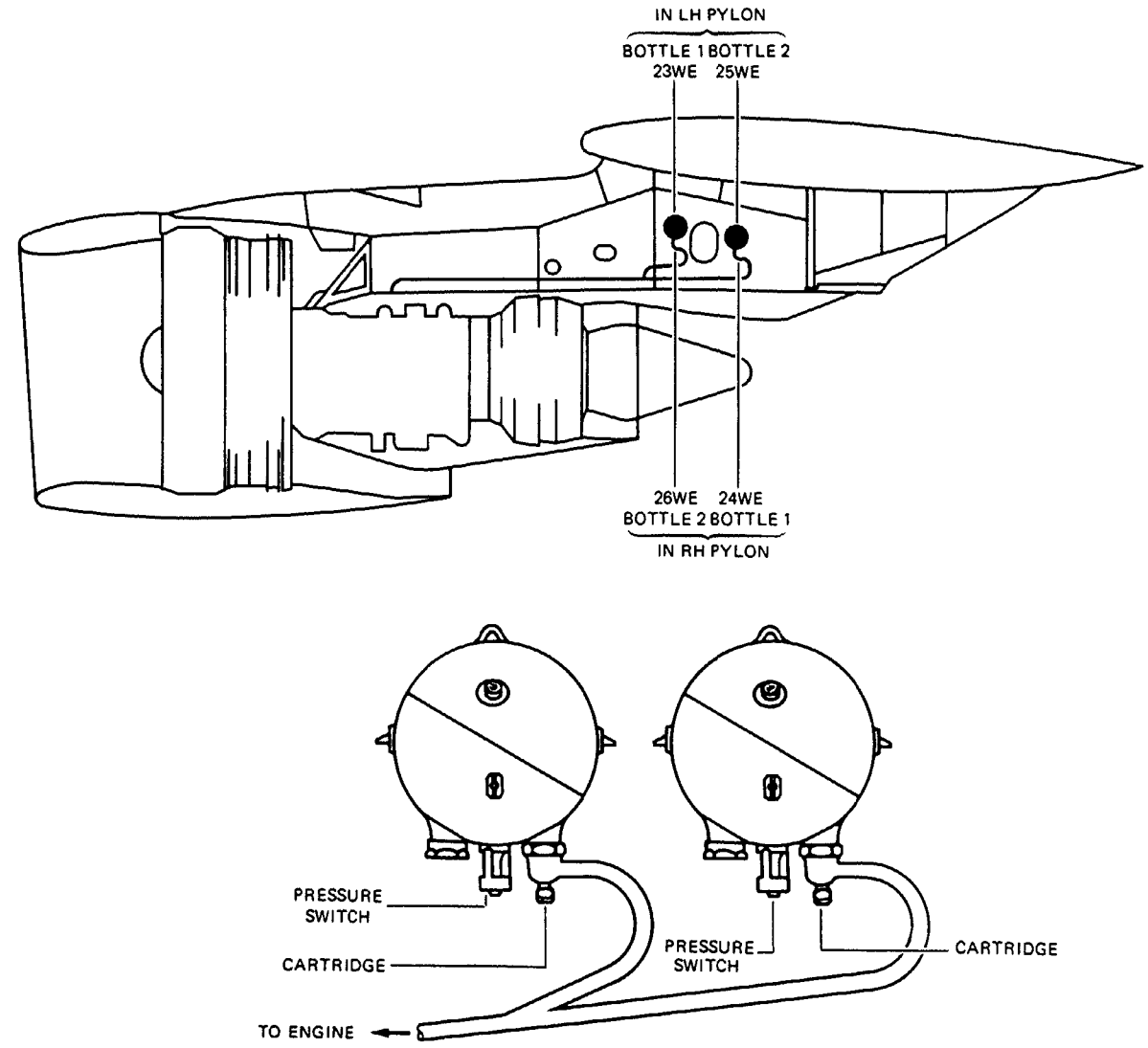
R **ON A/C 001-100,

(Ref. Fig. 005)

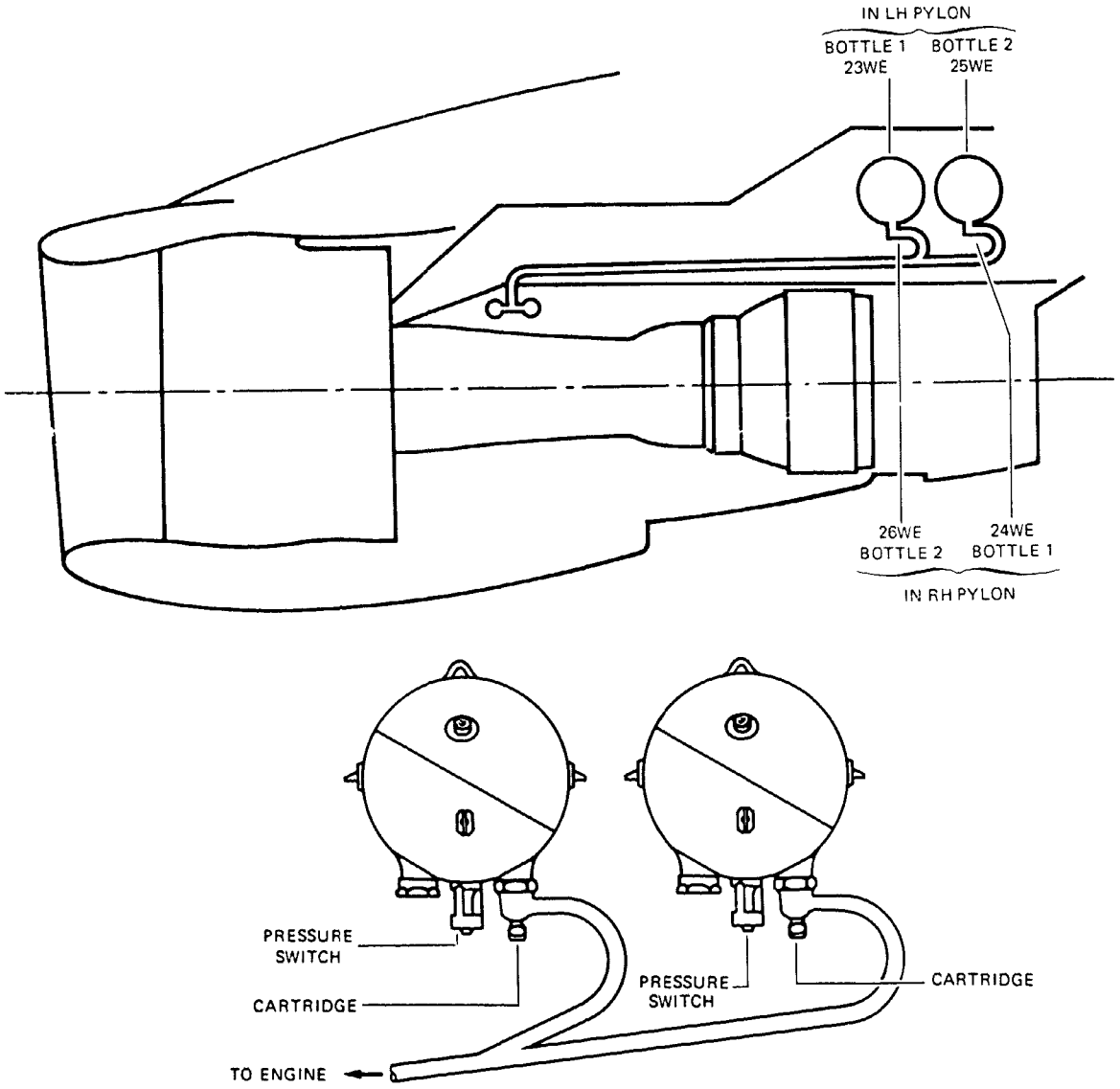
R **ON A/C ALL

Two fixed fire extinguisher bottles located in forward cargo compartment are used to extinguish fires in cargo compartments.
Operation of the two guarded wirelocked switches on CARGO COMPT SMOKE DET panel will discharge fire extinguisher bottles into either forward cargo compartment or aft and bulk cargo compartment.

4. Avionics Compartment Fire Extinguishing (Ref. 26-24-00)




Engine Fire Extinguishing - Location
Figure 001

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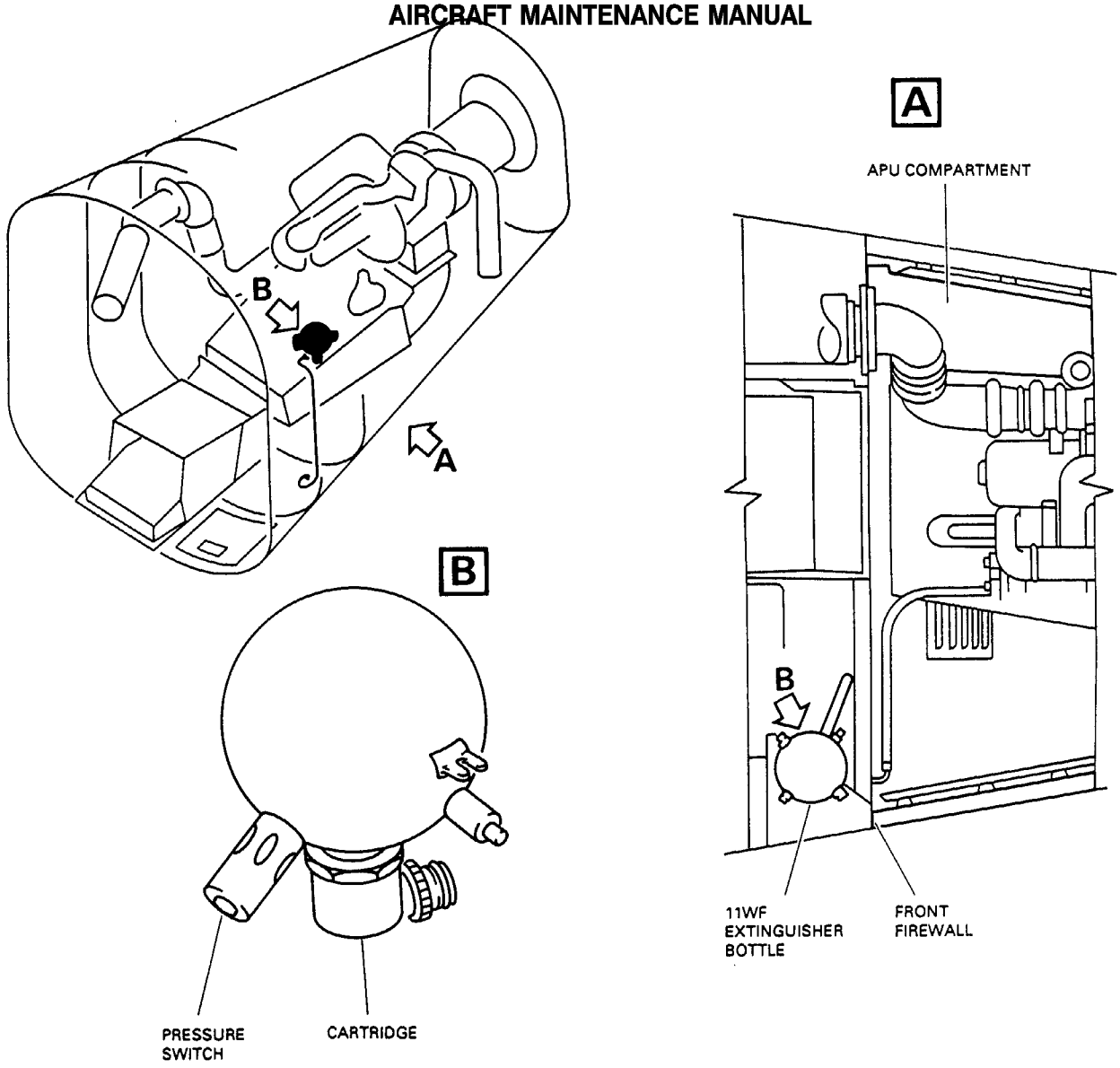
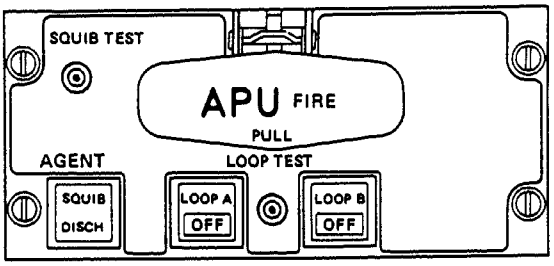
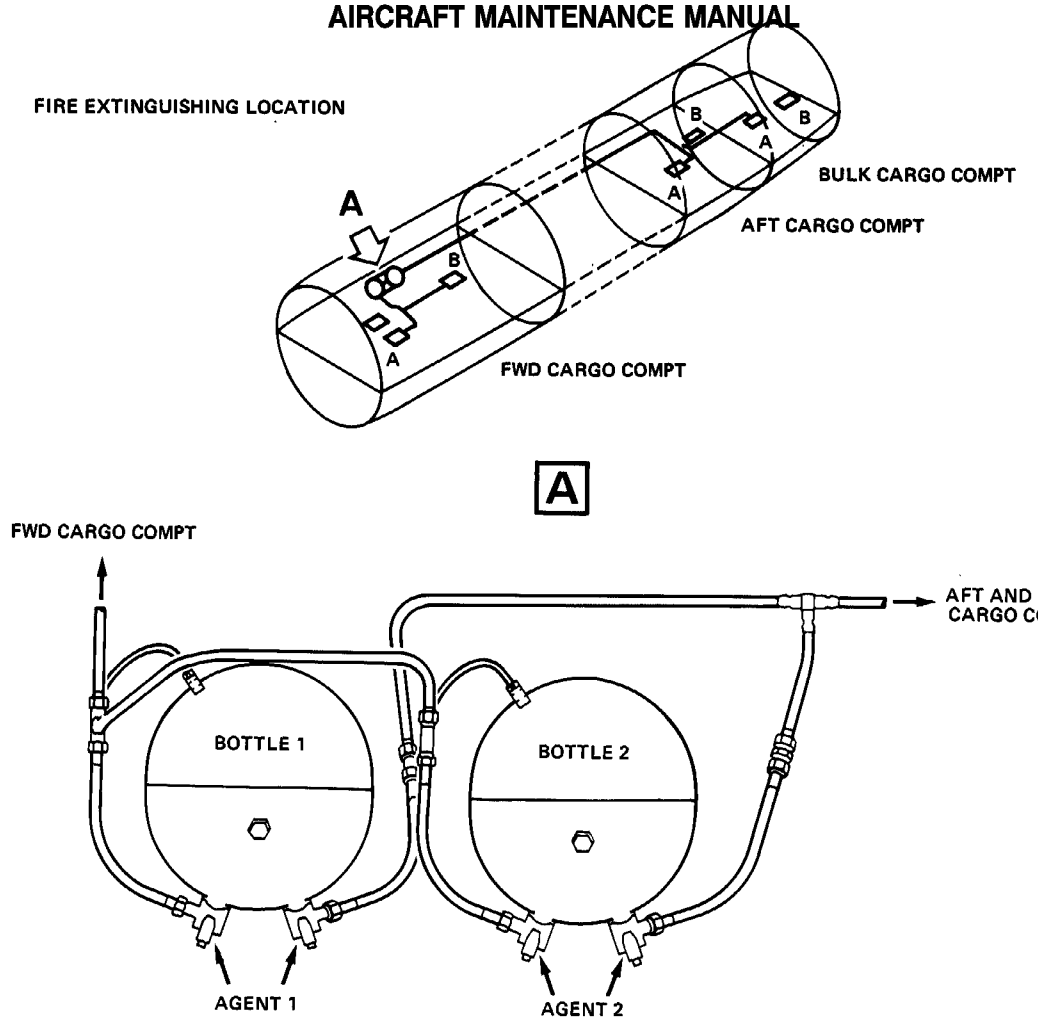
Engine Fire Extinguishing - Location
Figure 002

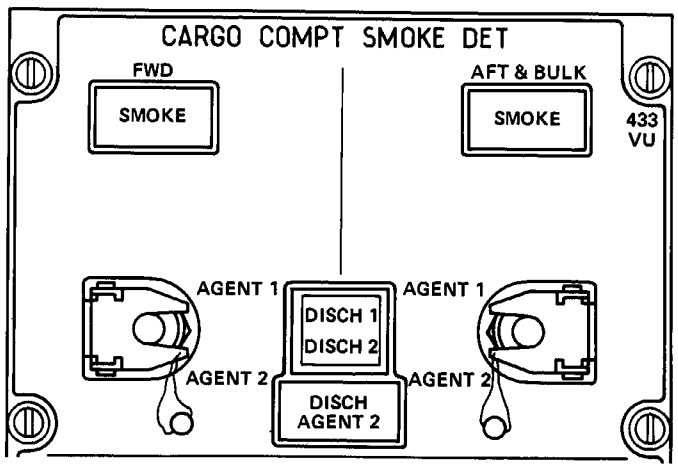



BMS 26 20 00 0 AAJO - 00

APU Fire Extinguishing - Location
Figure 003

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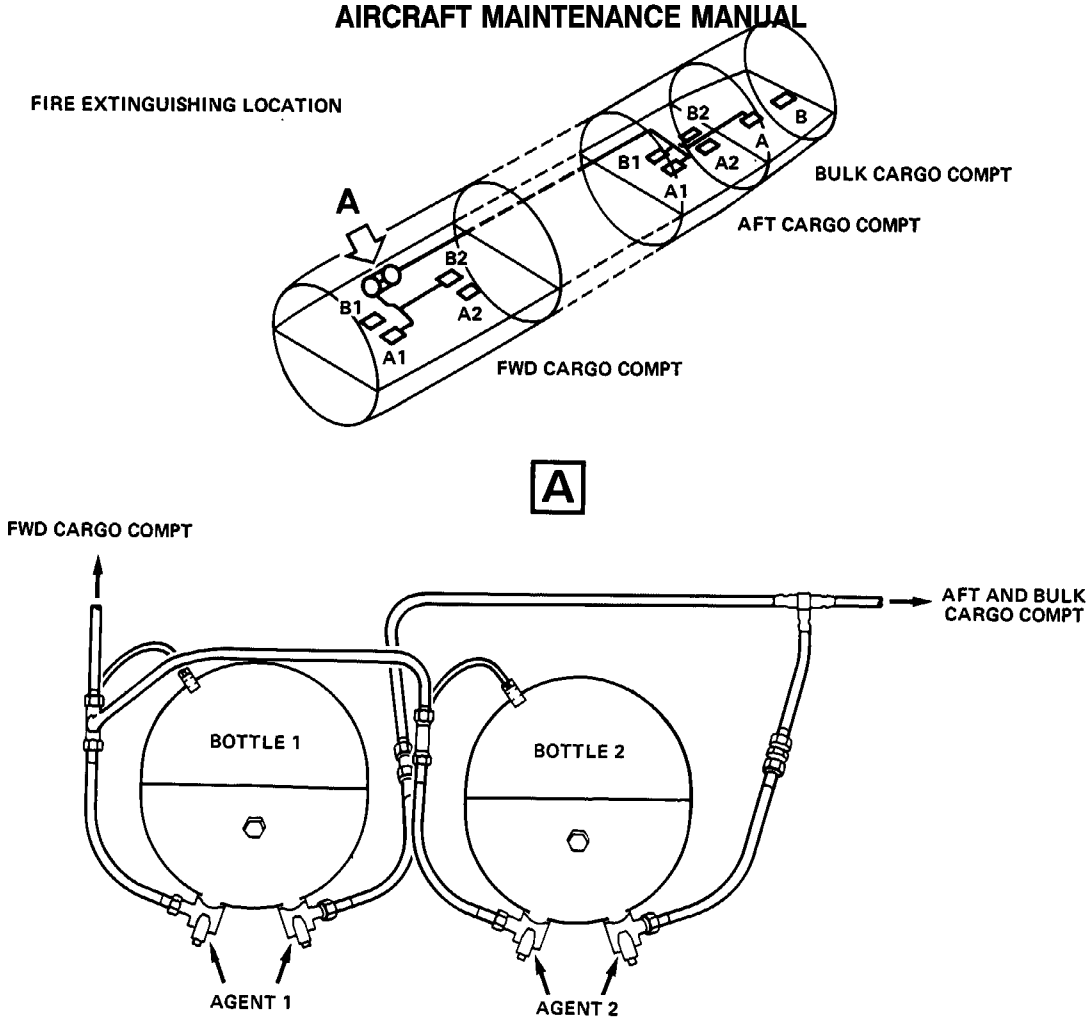
Cargo Compartment Fire Extinguishing - Location
Figure 004

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Cargo Compartment Fire Extinguishing - Location
Figure 005

A portable fire extinguisher located on the nose landing gear well is used to extinguish fire in the avionics compartment.

5. Flight Compartment Fire Extinguishing (Ref. 26-24-00)
   A portable fire extinguisher located in the flight compartment is used to extinguish fire in the flight compartment.

6. Passenger Compartment Fire Extinguishing (Ref. 26-24-00)
   The portable fire extinguishers located in various parts of the passenger compartment are used to extinguish fire in the passenger compartment.

7. Fire Extinguisher Bottle Electrical Supply
   All fire extinguisher bottle systems are supplied from the DC essential busbar 3PP. Both fire extinguisher bottle systems of both engines and fire extinguisher bottle 2 system of the cargo compartment are also supplied from the batteries.
   (Ref. Fig. 006)

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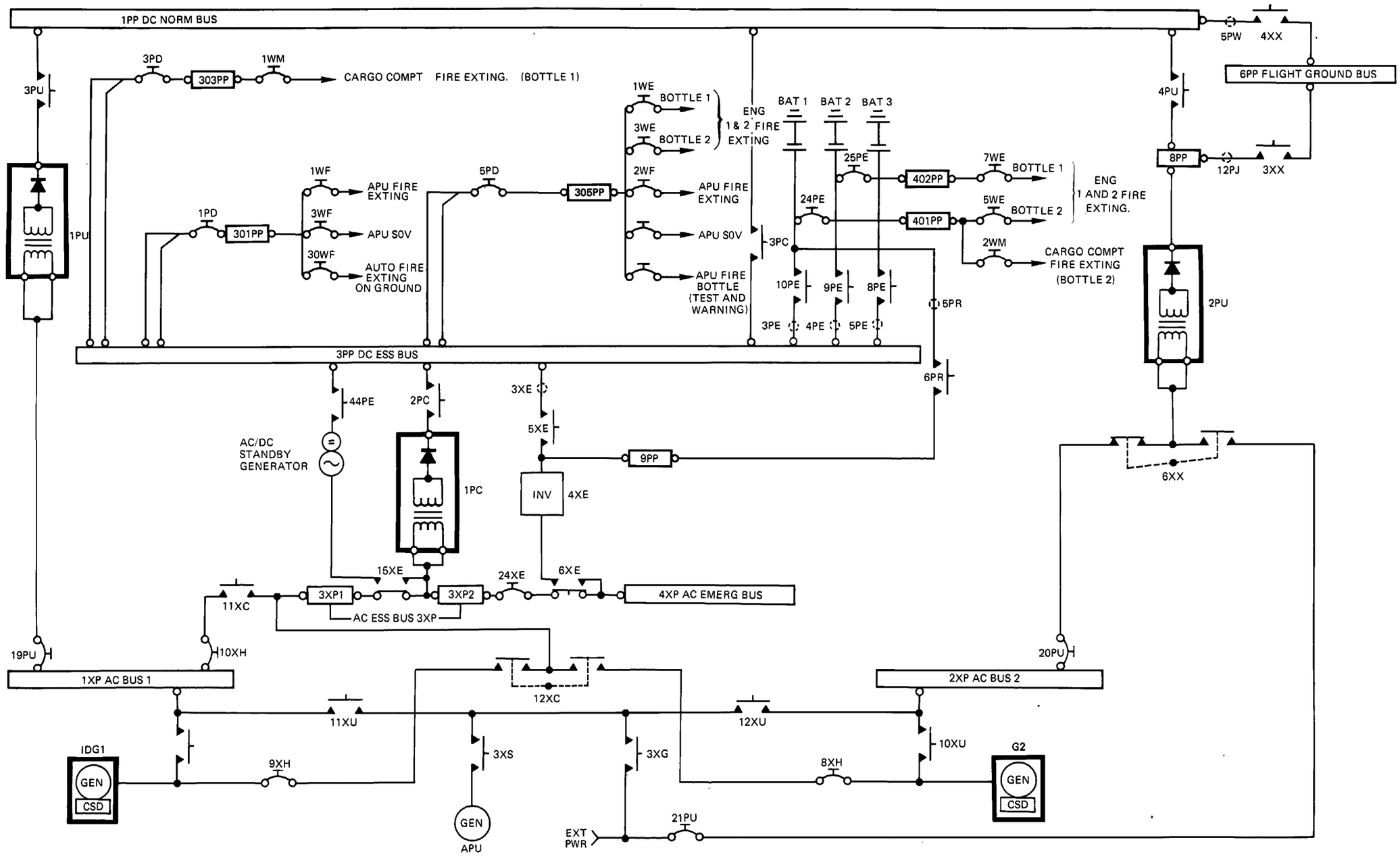


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Fire Extinguishing-Electrical Supply
Figure 006

1. General

The fire extinguishing system is activated when a fire is detected by the fire and overheat detection system. The system has two main effects :

- to extinguish, at its early stages, any fire occurring in the nacelle protected areas following excessive overheat or flammable fluid leaks which would endanger the aircraft safety.
- to prevent engine fire from spreading by isolating the engine from the rest of the aircraft; this is achieved by closing the various supplies : hot air, fuel, electrical power.

2. Component Location

(Ref. Fig. 001)

R **ON A/C 101-200,

(Ref. Fig. 002)

R **ON A/C 001-100,

(Ref. Fig. 003)

R **ON A/C ALL

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 15KC | WARNING LIGHT-FUEL/HP VALVE/ENG1 | 9VU | 211 | 121BL | 76-12-11 |
| 16KC | WARNING LIGHT-FUEL/HP VALVE/ENG2 | 9VU | 211 | 121BL | 76-12-11 |
| 23WE | BOTTLE-FIRE EXTING, ENG1 | | 473 | 474AR | 26-21-11 |
| 24WE | BOTTLE-FIRE EXTING, ENG2 | | 483 | 484AR | 26-21-11 |
| 25WE | BOTTLE-FIRE EXTING, ENG1 | | 473 | 473AR | 26-21-11 |
| 26WE | BOTTLE-FIRE EXTING, ENG2 | | 483 | 483AR | 26-21-11 |

3. Description

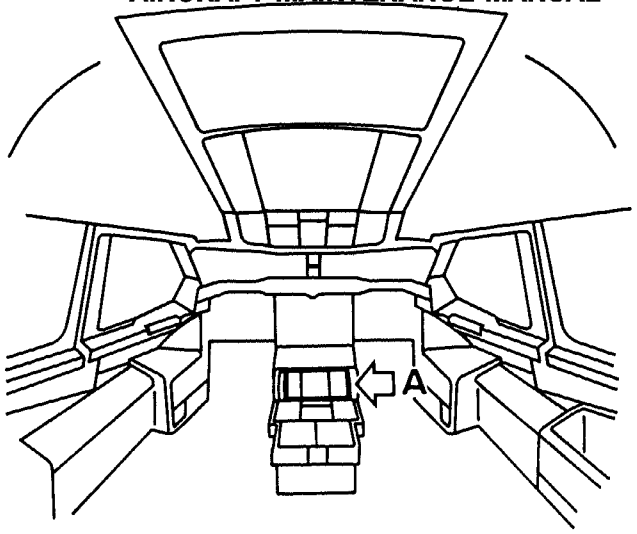
The quantity of extinguishing liquid required is kept in two extinguisher bottles located in the nacelle fire areas; they are controlled from the flight compartment.

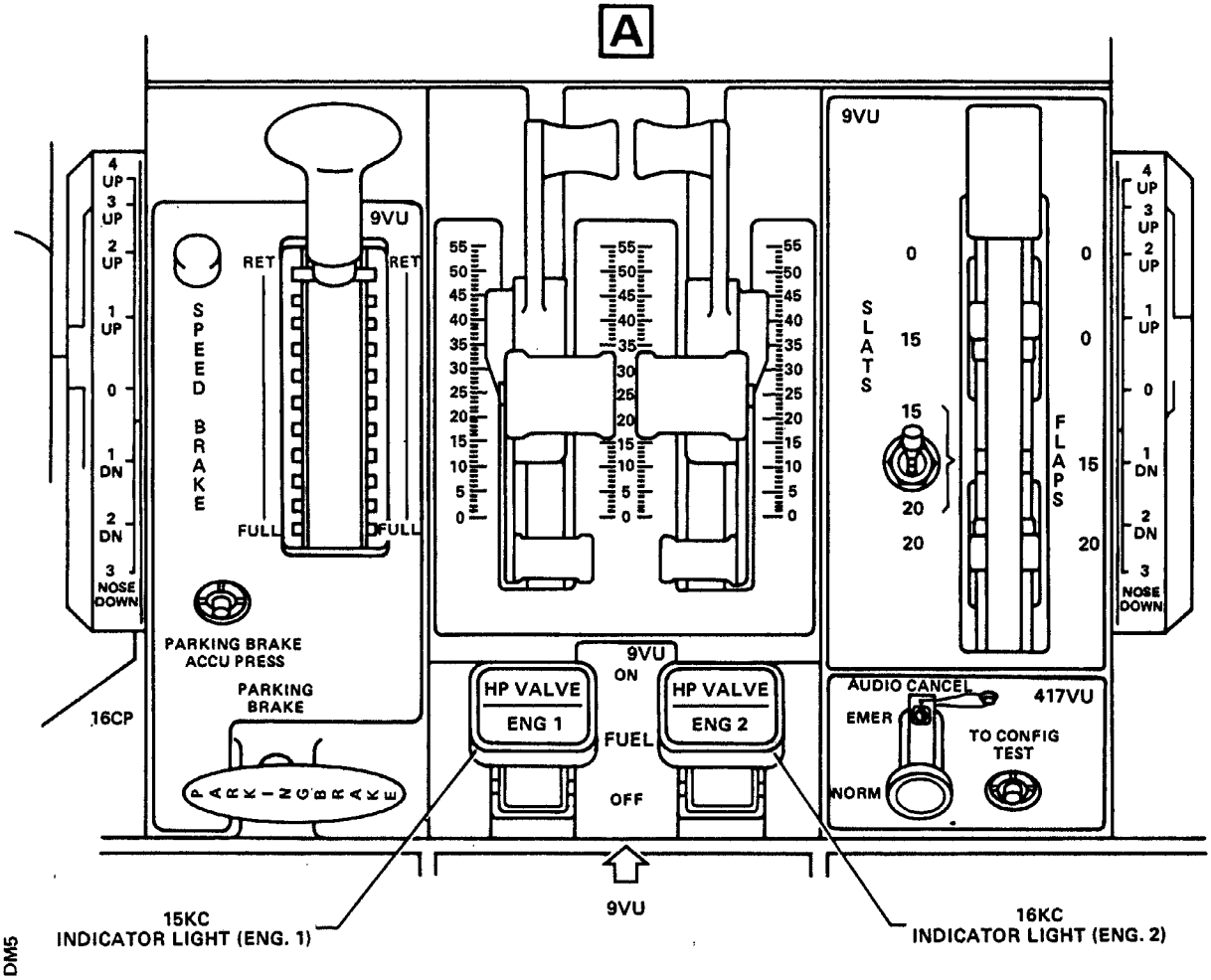
These extinguisher bottles, located in the aft part of the engine pylon are connected to the extinguishing system also located in the pylon. The spray nozzles only penetrate into the fire area.

A. Fire Extinguishing System and Components (for each nacelle)

(1) Extinguisher bottles and associated components (Ref. Fig. 004)

The two spherical bottles are of the rapid discharge type, their volume is 630 cubic inches (10.3 l); they contain 16 lbs (7.257 kg) of Bromo-trifluoromethane (CBrF3) pressurised by 1lb (2.205 kg) of nitrogen ; nominal pressure is 800 psig (55.15 bars) at 21°C ambient temperature. Each bottle is provided with two outlet ports; only one of them is

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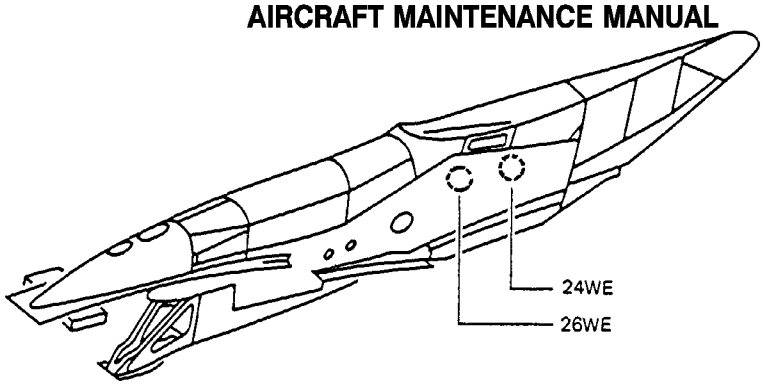
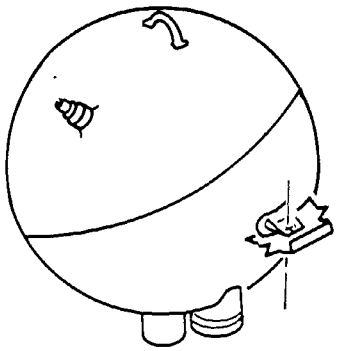
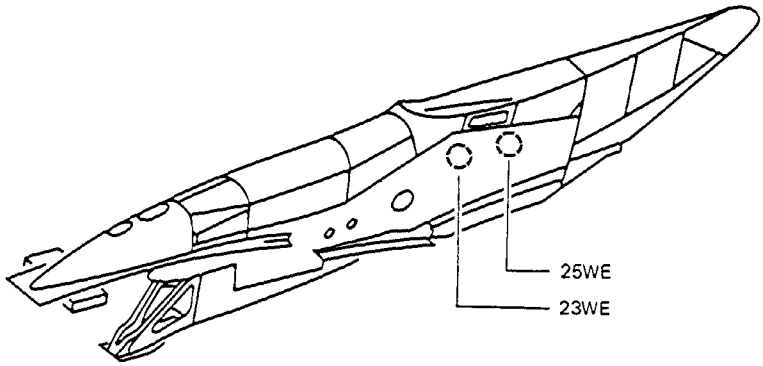
Indicator Lights - Location
Figure 001

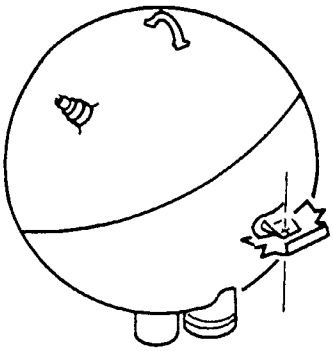



24WE 26WE
BOTTLE-FIRE EXTINGUISHER






25WE 23WE
BOTTLE-FIRE EXTINGUISHER



BM5 26 21 00 0 ABMO - 08 - 03
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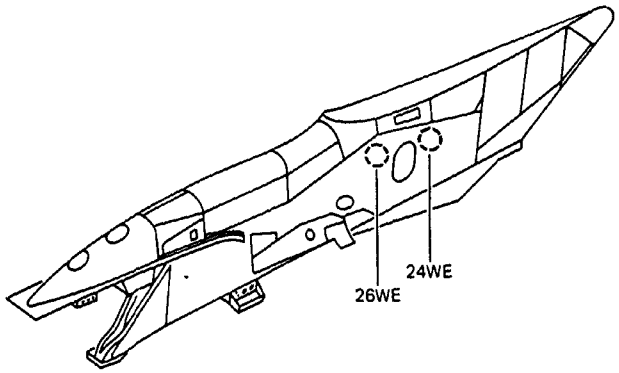
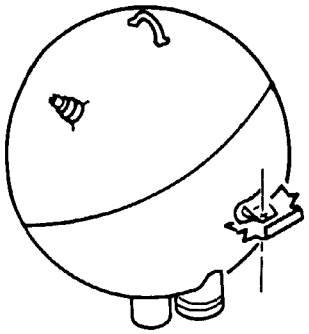
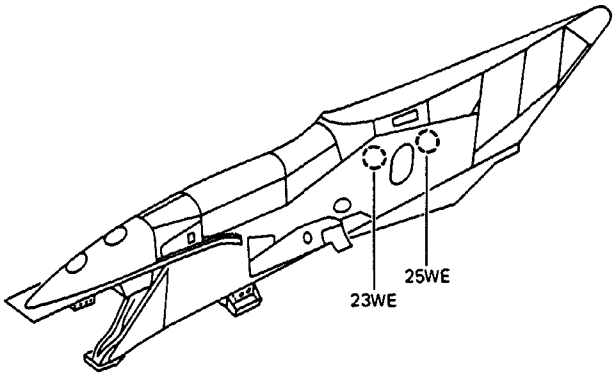
Fire Extinguisher Bottles - Location
Figure 002

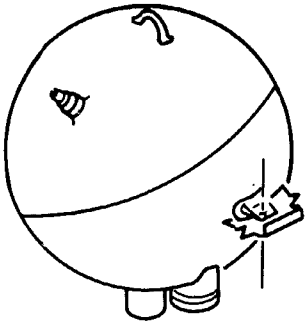



24WE 26WE
BOTTLE-FIRE EXTINGUISHER






25WE 23WE
BOTTLE-FIRE EXTINGUISHER



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Fire Extinguisher Bottles - Location
Figure 003

connected to the extinguishing system through a discharge head.
The second outlet port is not used. The discharge head is equipped with a discharge cartridge.
The cartridge contains explosive powder, the detonation of which is caused by 2 filaments supplied with 28VDC. These filaments are connected to a common ground wire; each of them can supply the power required for the detonation in case of failure of the other one.
The gas pressure released after cartridge percussion causes rupture of a leakproof metallic diaphragm installed on the discharge head.
The full quantity of extinguishant contained in the extinguisher bottle is released in the extinguishing system.
This diaphragm also functions as an overpressure valve in case of excessive pressure comprised between 1900 and 2200 psig (130.98 bars and 151.66 bars) in the extinguisher bottle due to overheat condition in the engine pylon. This device simplifies the fire extinguishing system on aircraft and prevents structural damage which could occur in the engine pylon. A pressure switch is located at the lower part of each extinguisher bottle between the two outlet ports. This pressure switch can be tested manually; it is calibrated to between 200 and 400 psig (13.787 bars to 27.575 bars) depending on the type of extinguisher bottle used. It is electrically connected to the DISCH warning lights in the flight compartment.

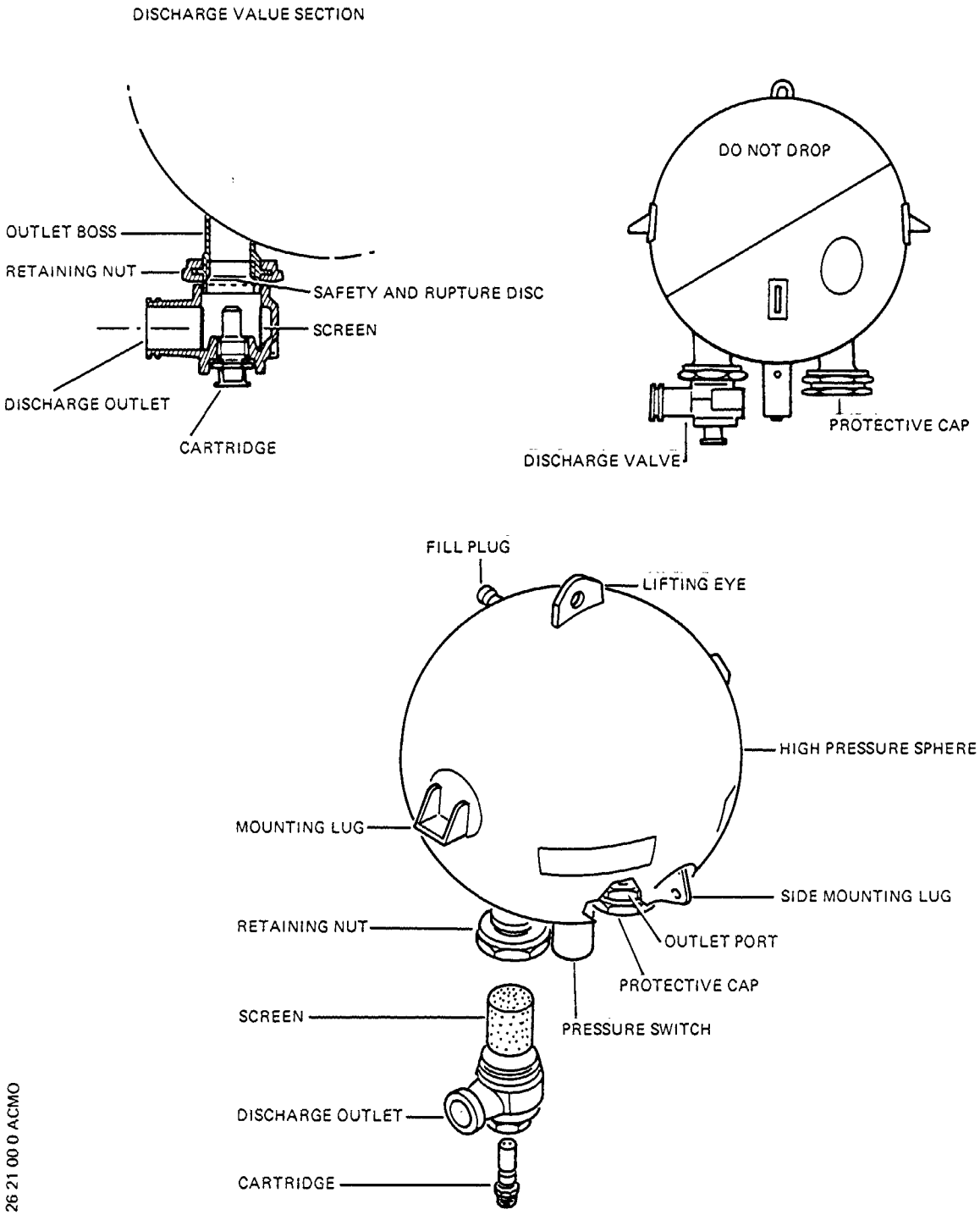
R **ON A/C 001-100,

(2)Extinguishing system (Ref. Fig. 005, 007)
The extinguishing system runs in the pylon (out of the fire area). The extinguisher bottles are connected to a stainless steel rigid pipe (dia. 38 mm (1.417 in.), thickness 1.6 mm (0.06in.)).
The engines have only the core compartment as fire zones.
The extinguishing agent is distributed as follows :
- Upper part of the engine, one manifold including :
  . a 14.5 mm (0.57 in.) and a 17 mm (0.67 in.) dia. nozzles spraying extinguishant in the upper right hand side of the engine,
  . a 14.5 mm (0.57 in.) and a 17 mm (0.67 in.) dia. nozzles spraying extinguishing in the upper left hand side of the engine,
  . a 17 mm (0.67 in.) dia. nozzles spraying extinguishing agent below the pylon fire wall towards the rear of the engine.
- Lower part of engine core :
  . a Y adaptor including two 11.3 mm (0.45 in.) dia. nozzles spraying extinguishant towards the core gear box.

NOTE : After use of extinguishing agent, for cleaning procedure (Ref. 72-00-00, P. Block 701).

R **ON A/C 101-200,

(2)Extinguishing system (Ref. Fig. 006, 008)
The extinguishing system runs in the pylon (out of the fire area). The extinguisher bottles are connected to a stainless steel rigid pipe (dia. 38 mm (1.417 in.), thickness 1.6 mm (0.06in.)).
The engines have only the core compartment as fire zones.




Engine Fire Extinguisher Bottle
Figure 004

The extinguishing agent is distributed as follows :
- at level of engine pylon, the extinguishant is sprayed by means of three 14.5 mm (0.5708 in) dia nozzles and one 23 mm (0.9055 in) dia nozzle ;
- at level of lower part of engine core, the extinguishant is sprayed by means of one 12.5 mm (0.5 in) dia nozzle.

NOTE : After use of extinguishing agent, for cleaning procedure (Ref. 72-00-00, P. Block 701).

R **ON A/C ALL

4. Controls and indicators
(Ref. Fig. 009)
Each engine is provided with associated controls and indicators located on flight compartment overhead panel. These controls and indicators are the following ones :
- Two **AGENT 1** **AGENT 2** pushbutton switches with **SQUIB** and **DISCH** legends for percussion of extinguisher bottles.
- One **SQUIB TEST** pushbutton used to test the discharge cartridge filaments.

5. Utilization and Operation

R **ON A/C 001-100,

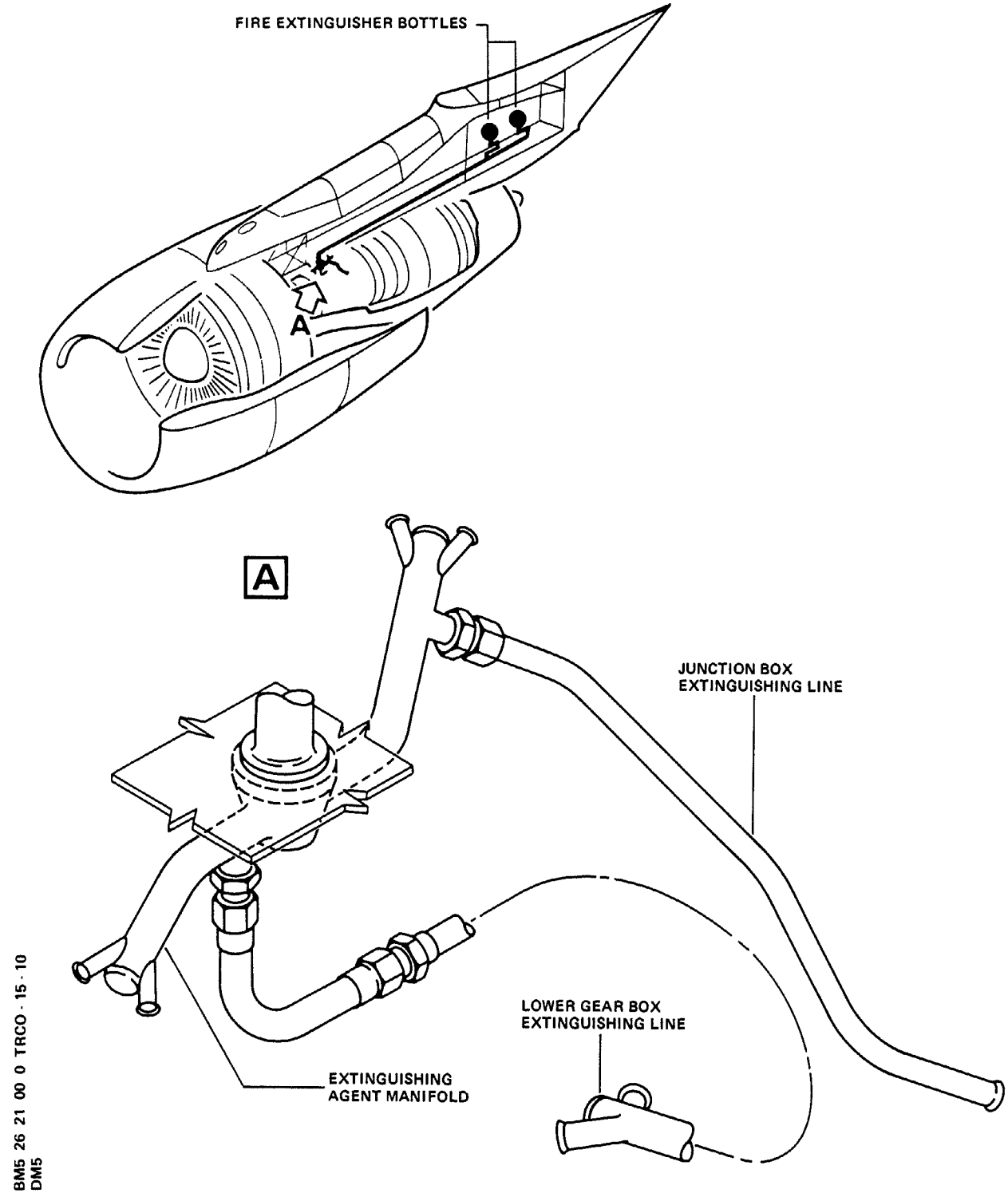
(Ref. Fig. 010)

R **ON A/C 101-200,

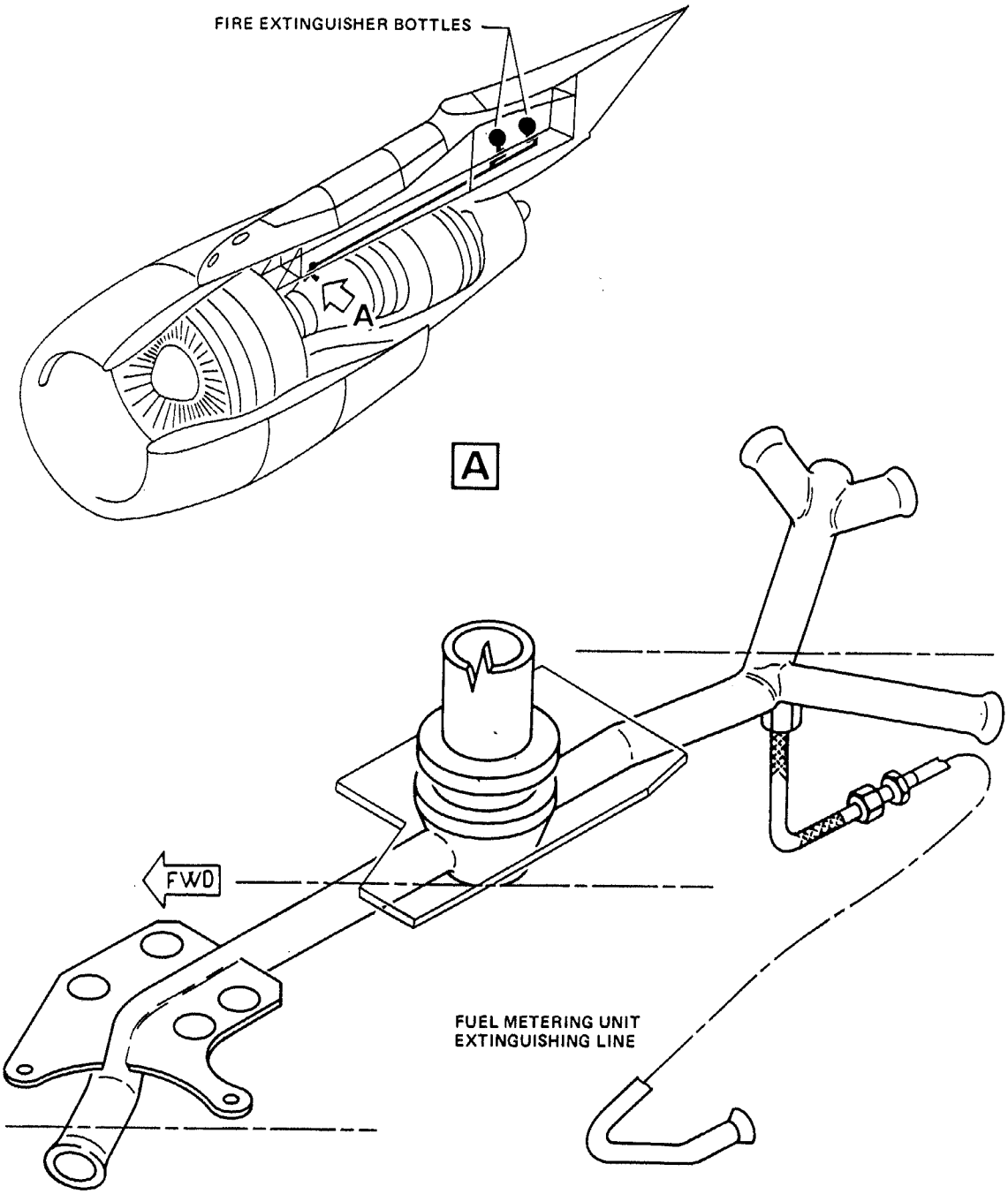
(Ref. Fig. 011)

R **ON A/C ALL

(Ref. Fig. 012, 013)
(1)Extinguishing procedure
In the event of engine fire warning, the following extinguishing procedure must be applied.
- Throttle control levers in idle position
- HP fuel shut-off valve closed (engine shut-down)
- Pull engine fire control handle which causes :
  . closure of LP fuel fire shut off valve
  . closure of fire valves
  . de-energization of the generator
  . cut off of all the air bleeds
  . closing of the air conditioning pack valve associated with the relevant engine
  . extinguishing of the fire detection loops warning lights **LOOP A** and **LOOP B** to eliminate the risk of false maneuvers during the following steps of the procedure
  . illumination of the **SQUIB** warning lights associated with the two




Fire Extinguishing System Layout in Pylon and Engine
Figure 005

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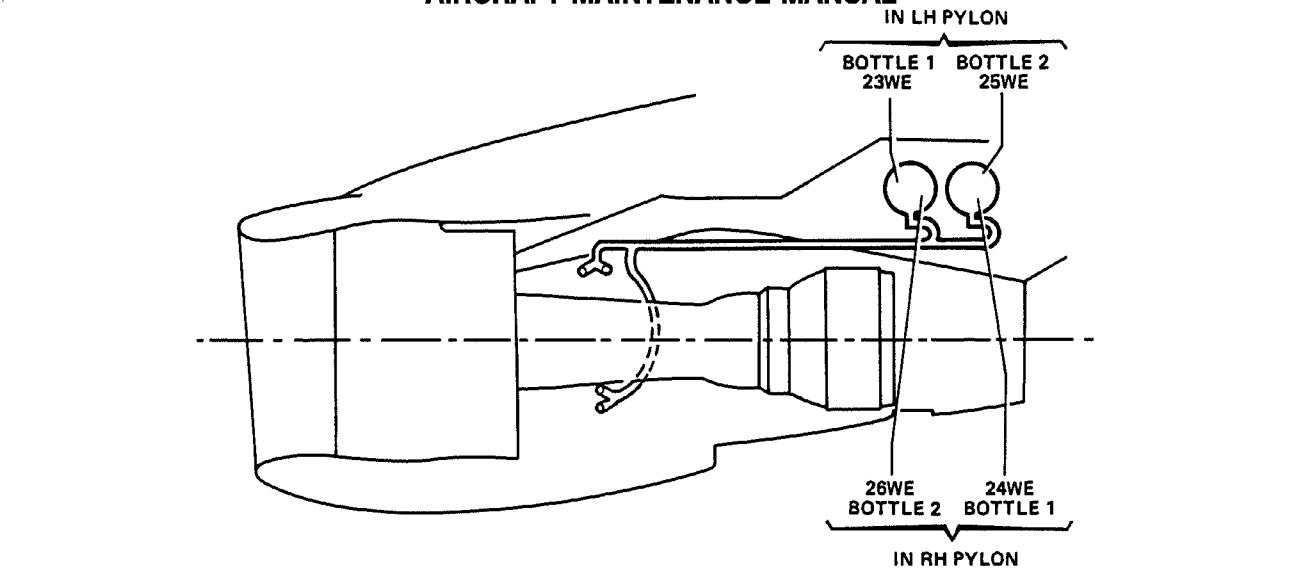
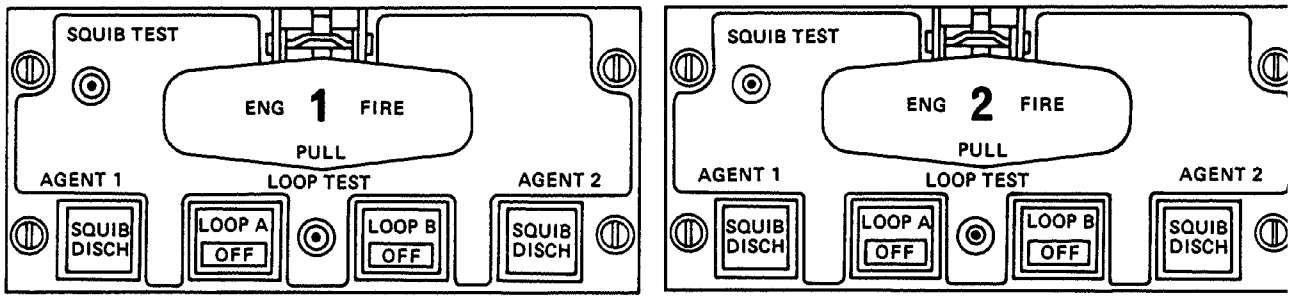
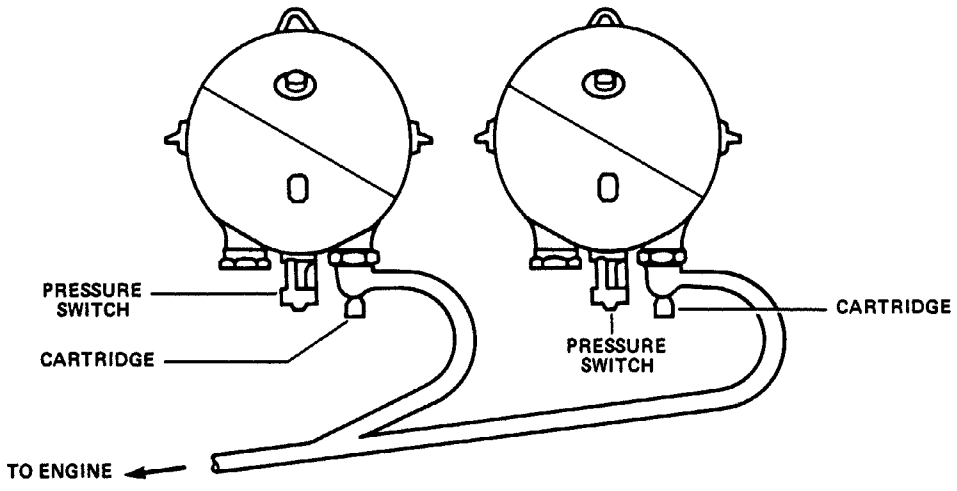
Fire Extinguishing System Layout in Pylon and Engine
Figure 006

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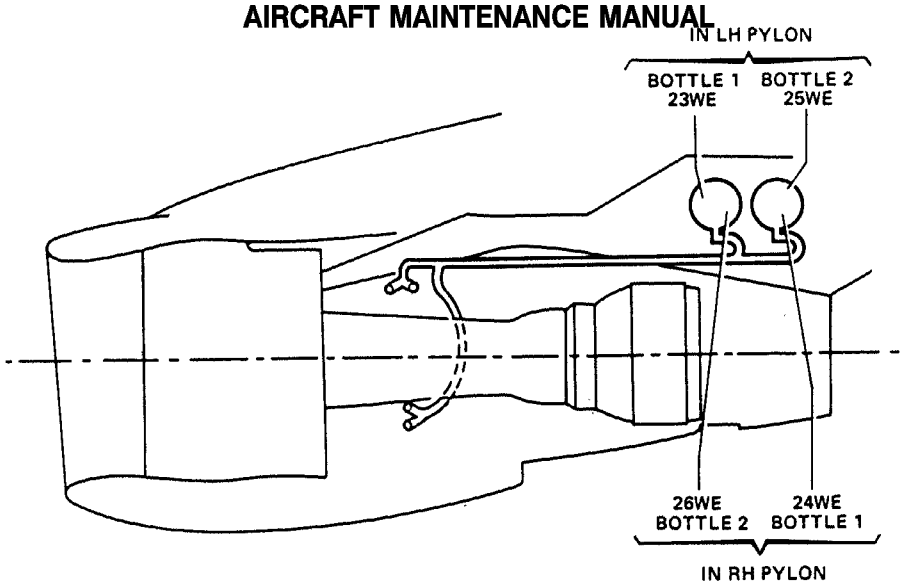
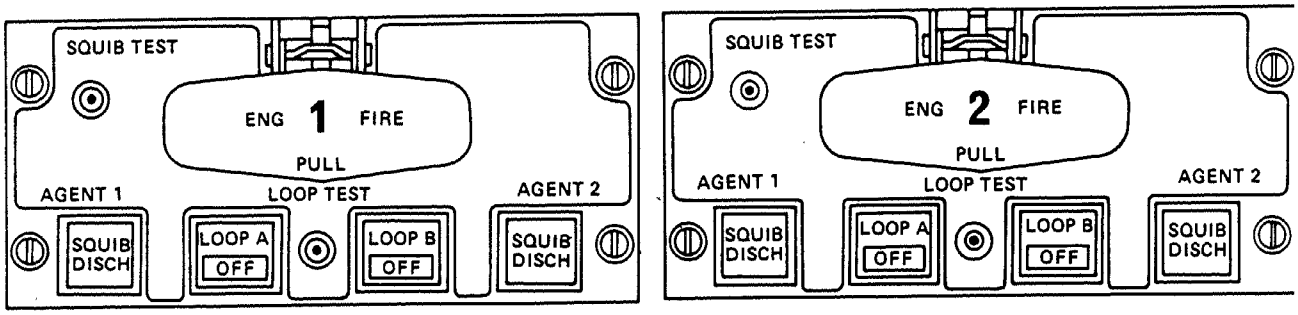
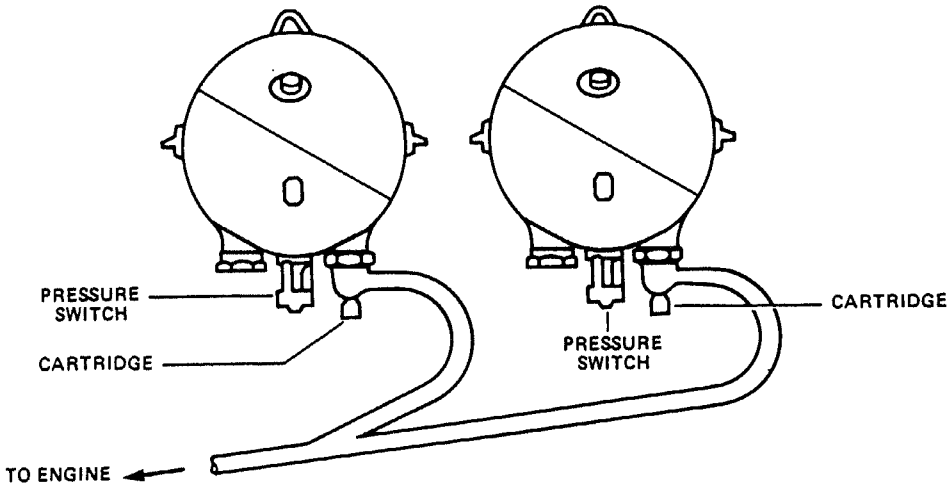
Location of System Components
Figure 007




BM5 26 21 00 0 PRXO 24 19
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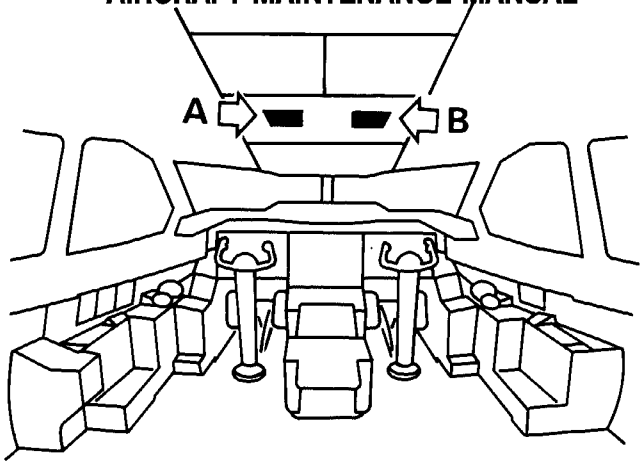
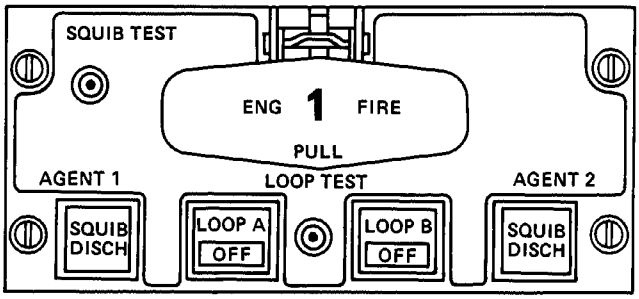
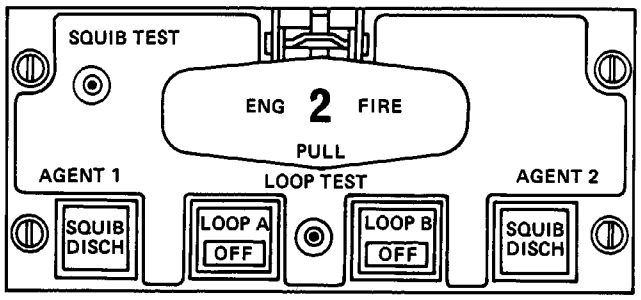
Location of System Components
Figure 008




A




B

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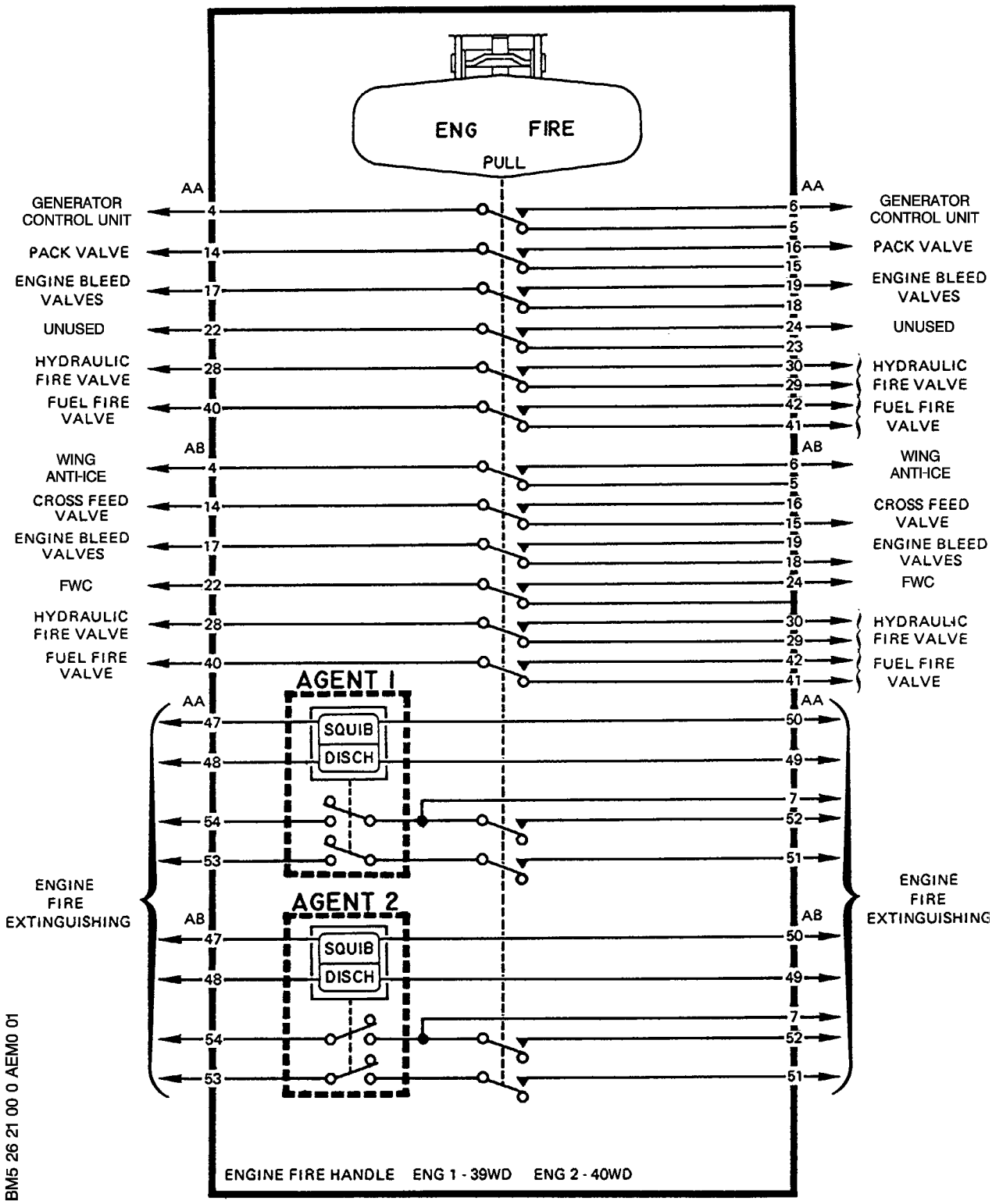
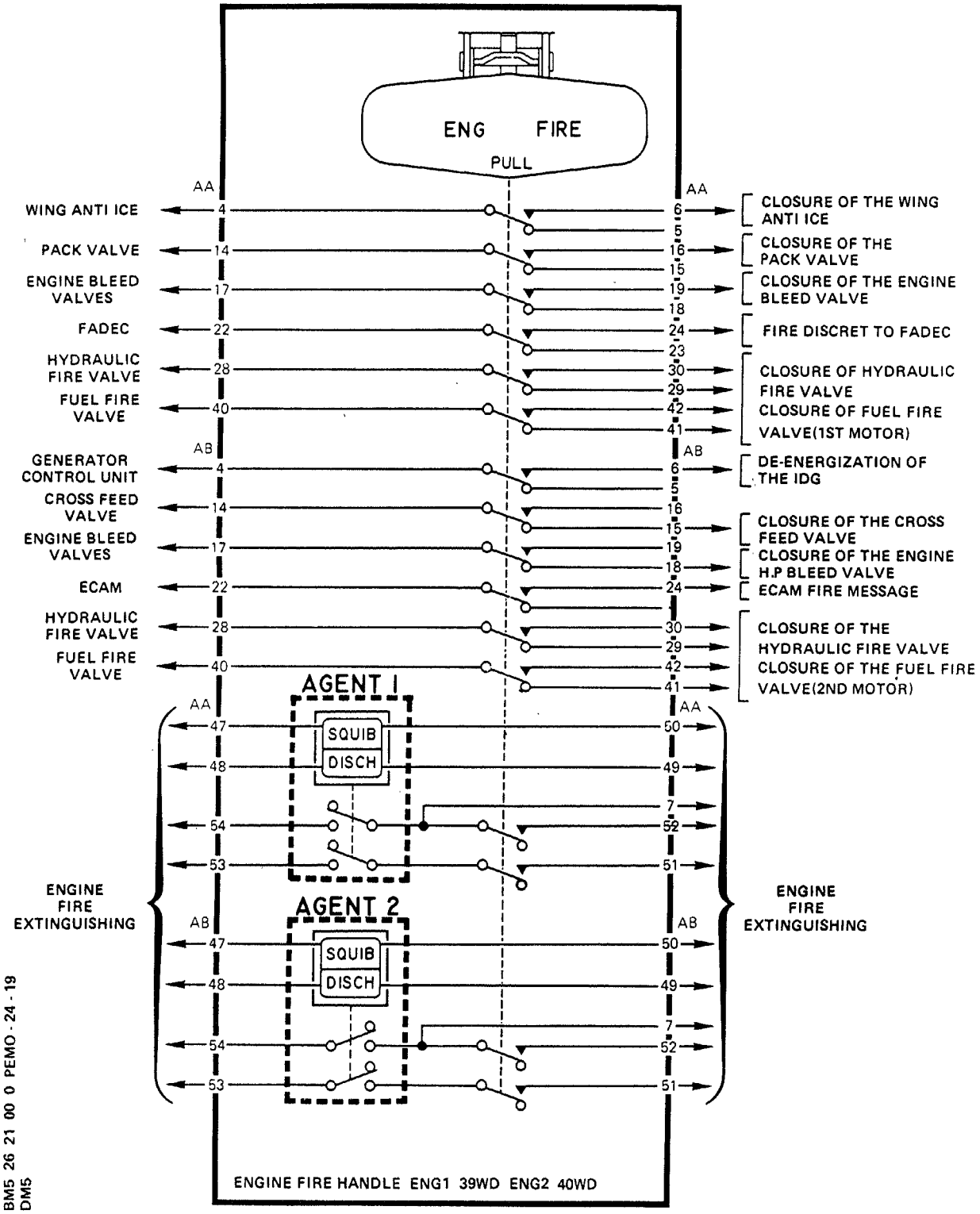
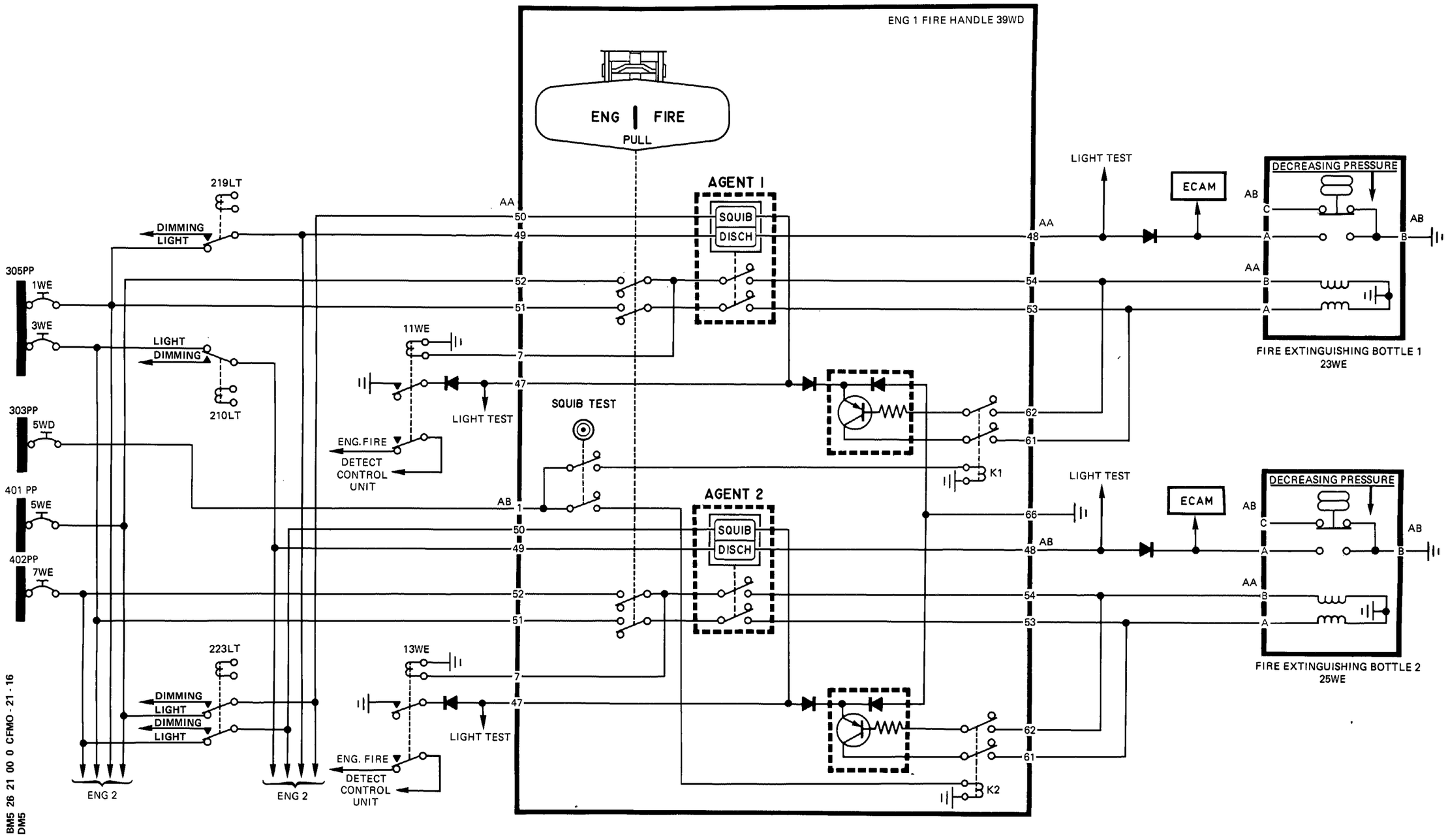
Engine Fire Extinguishing - Controls and Indicators
Figure 009




Engine Fire Extinguishing - Handle and Indicators
Figure 010




Engine Fire Extinguishing - Handle and Indicators
Figure 011

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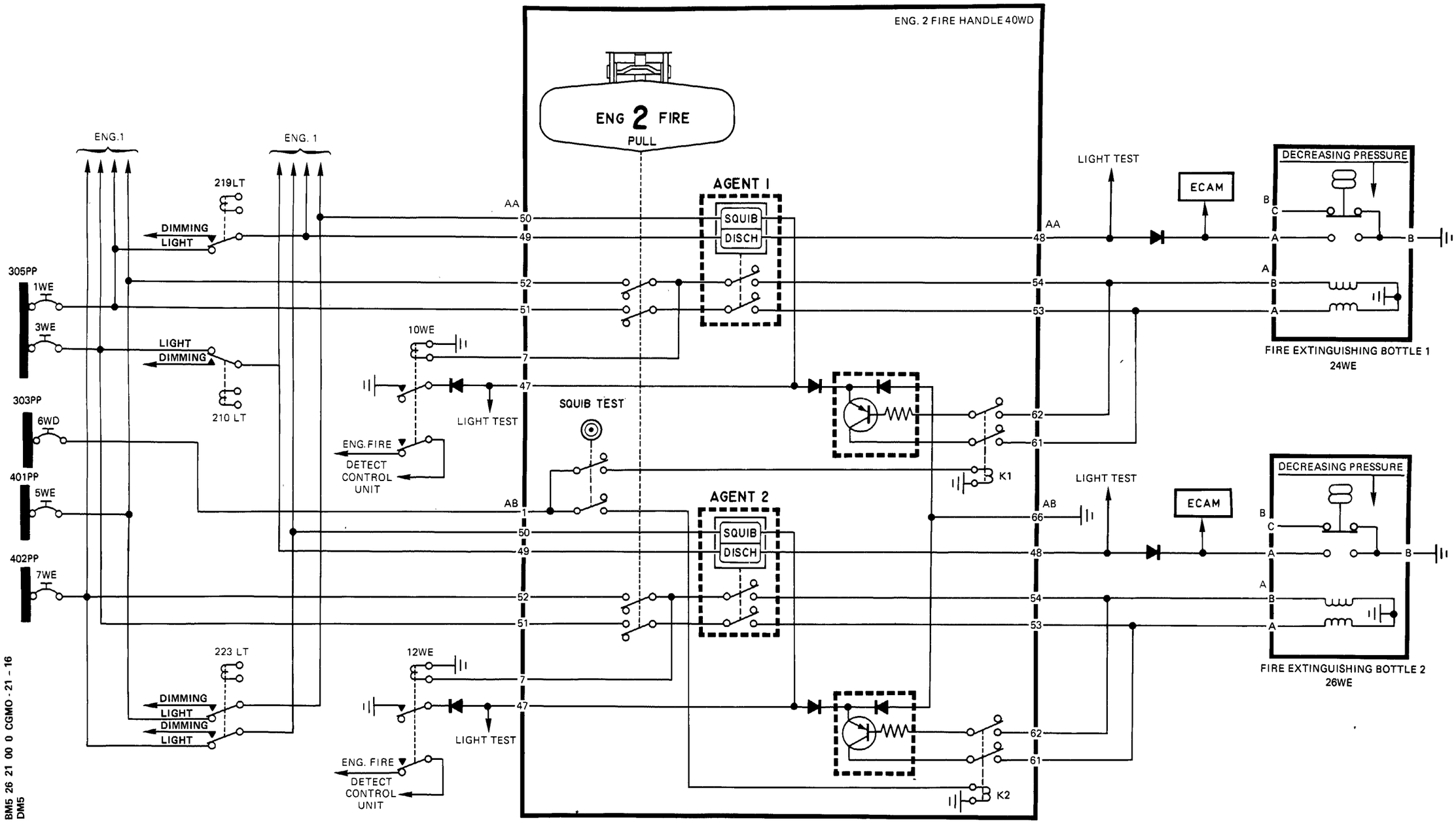
Engine 1 Fire Extinguishing - Circuit Schematic
Figure 012

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Engine 2 Fire Extinguishing - Circuit Schematic
Figure 013

extinguisher bottles
. stop of the aural warning
- Wait for 10 seconds which is the time required to reach windmilling during flight for which the extinguishing procedure efficiency will be optimum.

Proceed with extinguisher bottle percussion by pressing the **AGENT** push-button switch ; bottle discharge is indicated by the illumination of the **DISCH** amber legend.

If the **FIRE** warning light does not disappear within 30 seconds, the second bottle will be squibbed.

NOTE : The list of the actions to be performed during the extinguishing procedure is automatically displayed on the **ECAM** display unit simultaneously with the **FIRE** warning. As soon as the required actions are accomplished, the corresponding line is automatically cancelled on the **ECAM** display unit.

(2)Test of the discharge cartridges

When the **SQUIB TEST** pushbutton corresponding to each bottle is pressed, the **SQUIB** legend on **AGENT 1 - AGENT 2** pushbutton switches comes on.

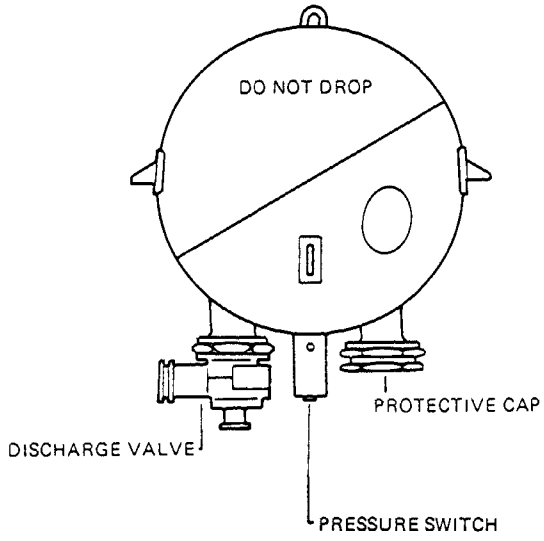
NOTE : Although only one filament is sufficient to enable operation of the discharge cartridge, the test will be positive only if the two filaments are electrically supplied.

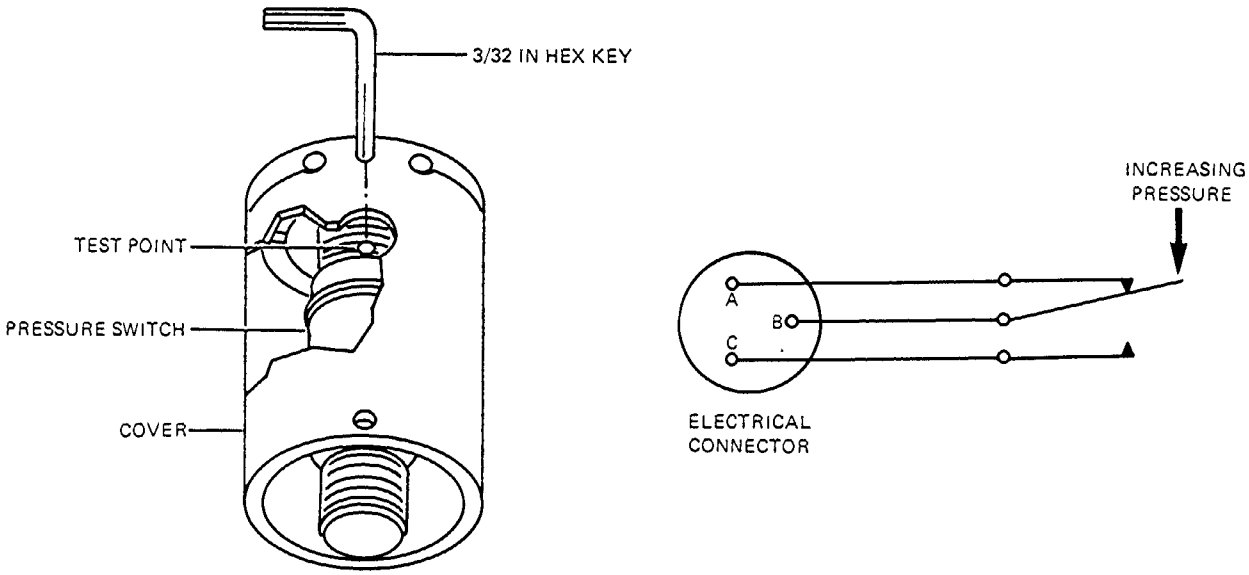
The test current intensity is limited to 1A by the test module (transistor) while the percussion current is 2 to 3.5 A.

(3)Check of extinguisher bottle pressure (Ref. Fig. 014)

The pressure switch is provided with a manual check device controlled by the diaphragm used to check the electrical contacts. A recess is provided in the pressure switch body ; the electrical continuity between the contacts is checked by engaging an hexagonal key in this recess. The continuity can be checked whatever the pressure in the extinguisher bottle as indicated below :

p > minimum pressure : no continuity between **A** and **B**
p < minimum pressure : continuity between contacts **A** and **B**
p = nominal pressure : continuity between contacts **B** and **C**
no continuity between contacts **A** and **B**

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Check of Extinguisher Bottle Pressure
Figure 014

## 1. Operational Test (SQUIB TEST)

A. Reason for the Job
Test of the discharge cartridges

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure

**WARNING : BEFORE ATTEMPTING TEST, MAKE CERTAIN THAT ENG1 AND ENG2 FIRE HANDLES ARE IN PUSHED IN POSITION.**

(1) Job set-up
(a) Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b) Make certain that electronics racks ventilation is correct.
(c) If aircraft on ground : make certain that circuit breakers of engine fire extinguishing and engine fire detection circuits are closed.
(d) On **ENG1 (ENG2) FIRE** handle control module **39WD (40WD)**, make certain that **AGENT1** and **AGENT2** pushbutton switches are released.

(2) Test

| ACTION | RESULT |
|---|---|
| On **ENG1 (ENG2) FIRE** handle control module **39WD (40WD)** | |
| - press **SQUIB TEST** pushbutton switch | On control module **39WD (40WD)**<br>- **SQUIB** legend of **AGENT1** pushbutton switch comes on<br>- **SQUIB** legend of **AGENT2** pushbutton switch comes on |
| - release **SQUIB TEST** pushbutton switch | - **SQUIB** legend of **AGENT1** pushbutton switch goes off<br>- **SQUIB** legend of **AGENT2** pushbutton switch goes off. |

(3) Close-up
(a) De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b) Restore system and aircraft to normal operating condition.

2. Operational Test

R A. Continuity Check of Electrical Percussion Circuit

(1)Reason for the Job

Make certain that the electrical circuits of ENG1 (ENG2) fire extinguisher bottle cartridges are in correct operating condition. The SQUIB TEST, carried out as part of the check list, does not make use of the same electrical circuit.

(2)Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (a) | Access Platform 4m (13 ft. 1 in.) |
| (b) | Voltmeter |
| Referenced Procedure<br>- 24-41-00, P. Block 301 | A/C External Power Control |

(3)Procedure

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS ARE ISOLATED.

CAUTION : PULLING THE FIRE CONTROL HANDLE CAUSES LP FUEL, HYDRAULIC FIRE, BLEED AIR, ANTI ICE AND AIR CONDITIONING PACK VALVES TO CLOSE AND GENERATOR EXCITATION TO BE CUT OFF. THEREFORE, PRIOR TO PULLING THE HANDLE, MAKE CERTAIN THAT THIS WILL NOT INTERFERE WITH WORK BEING PERFORMED ON THE OTHER SYSTEMS.

(a)Job set-up

1 Install access platform at access doors 473AL (483AR) and 474AR (484AR).
2 Open access doors 473AL (483AL) and 474AR (484AR).
3 Disconnect plug 23 (24) WE-A from bottle 1 and 25 (26) WE-A from bottle 2 in engine pylon.
4 Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
5 Make certain that electronics racks ventilation is correct.
6 If aircraft on ground : make certain that circuit breakers of engine fire extinguishing circuits are closed.

WARNING : CARTRIDGE ELECTRICAL PINS MUST BE SHUNTED WITH A PROTECTIVE SHUNT WICH IS PROVIDED BY THE MANUFACTURER, A SHUNT PLUG OR SHORTING CLIP, TO PREVENT BOTTLE DISCHARGE WHICH COULD CAUSE INJURY TO MAINTENANCE PERSONNEL.

(b)Test

| ACTION | RESULT |
|---|---|
| 1. On ENG1 (ENG2) FIRE handle control module 39WD (40WD)<br>- pull ENG1 (ENG2) FIRE handle.<br>- press LOOP TEST pushbutton switch for approx. 4 s<br><br>- release LOOP TEST pushbutton | On control module 39WD (40WD)<br>- single chime sounds.<br>- both SQUIB legends come on.<br>- both LOOP legends must be off<br>- red warning light of ENG1(2) FIRE handle comes on<br>- red warning light of ENG1 (2) |

| ACTION | RESULT |
|---|---|
| switch | FIRE handle goes off |
| - press AGENT1/SQUIB DISCH pushbutton switch | - on disconnected cartridge connector plug 23 (24) WE-A, check for 28 Volts between terminal A and ground and between terminal B and ground |
| - release AGENT1/SQUIB DISCH pushbutton switch | - check for zero volts between terminal A and ground and then terminal B and ground |
| - press AGENT2/SQUIB DISCH pushbutton switch | - On disconnected cartridge connector plug 25 (26) WE-A, check for 28 Volts between terminal A and ground and between terminal B and ground |
| - release AGENT2/SQUIB DISCH pushbutton switch | - check for zero volts between terminal A and ground and then terminal B and ground. |
| - push ENG1 (ENG2) FIRE handle | - both SQUIB legends go off. |

WARNING : BEFORE INSTALLING CARTRIDGE CONNECTOR PLUG, REMOVE PROTECTIVE SHUNT, SHUNT PLUG OR SHORTING CLIP FROM CARTRIDGE ELECTRICAL PINS.
MAKE CERTAIN THAT THERE IS NO SHUNT BETWEEN THE PINS OF THE CARTRIDGE CONNECTOR PLUG.

(c)Close-up

1 On bottles 1 and 2, connect plugs to their respective cartridge connectors.
Perform operational test (SQUIB TEST) described in paragraph 1. C. (2) to check correct connection of plugs 23,24,25, 26WE-A.
NOTE : If the following test is to be performed, carry on with paragraph B i.e. do not de-energize the aircraft electrical network.

2 Close access doors 473AL (483 AL) and 474AR (484AR).

3 Remove access platforms.

4 Restore system and aircraft to normal operating conditions.

B. Operational Test of Bottle Low Pressure Indicating Circuit by Actuating
R Test Screw on Pressure Switch

(1)Reason for the Job

To check correct operation of warning lights indicating a loss of pressure in engine fire extinguisher bottles.

(2)Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (a) | Allen Wrench 3/32 in. |
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

(3)Procedure

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS ARE ISOLATED.

(a)Job set-up

1 Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

2 Make certain that electronics racks ventilation is correct.

3 If aircraft on ground : make certain that circuit breakers of engine fire extinguishing circuits are closed.

4 On ENG1 (ENG2) FIRE handle control module 39WD (40WD).
- make certain that ENG1 (ENG2) FIRE handle is latched in pushed position.
- make certain that AGENT1 and AGENT2 pushbutton switches are released.

5 Open, safety and tag the following circuit breakers (for safety reason)

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | FIRE EXTING/ENG 1 & 2/BTL 1 | 5WE | 207/C19 |
| 22VU | FIRE EXTING/ENG 1 & 2/BTL 2 | 7WE | 207/C20 |

(b)Test

| ACTION | RESULT |
|---|---|
| 1 On fire extinguisher bottle 23WE (24WE), in Left (right) engine pylon | |
| - engage Allen wrench in socket provided for this purpose in pressure switch. Turn wrench until stop is reached (approx. 1/4 turn) | On ENG1 (ENG2) FIRE control module 39WD (40WD)<br>- DISCH legend of AGENT1 pushbutton switch comes on. |
| - turn Allen wrench back to initial position | On control module 39WD (40WD)<br>- DISCH legend of AGENT1 pushbutton switch goes off |
| 2 On bottle 25WE (26WE) in left (right) engine pylon | |
| - engage Allen wrench in socket provided for this purpose in pressure switch. Turn wrench until stop is reached (approx. 1/4 turn). | On control module 39WD (40WD)<br>- DISCH legend of AGENT2 pushbutton switch comes on |
| - turn Allen wrench back to initial position | On control module 39WD (40WD)<br>- DISCH legend of AGENT2 pushbutton switch goes off |

(c)Close-up
1 De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
2 Restore system and aircraft to normal operating conditions.

C. Test of Engine Fire Extinguishing Lines

R
R

WARNING : BEFORE BEGINNING THE TESTS, MAKE CERTAIN THAT THE TEST EQUIPMENT IS FURNISHED WITH A SAFETY SYSTEM ENABLING THE ABSORPTION OF ANY POSSIBLE OVERPRESSURE WHICH MIGHT DAMAGE THE FIRE EXTINGUISHING BOTTLES.

(1)Reason for the Job
To make certain that extinguishing lines do not leak or are not clogged.

(2)Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (a) | Access Platform |
| (b) | Lockwire |
| (c)98A26203250024 | Blanking Plug Set |
| (d) | Pressure Gage - 0 to 5 bars (72.5 psi) |
| (e) | Air Supply, Pressure up to 2.07 bars (30 psi) |
| Referenced Procedures | |
| - 26-21-14, P. Block 401 | Discharge Heads |
| - 26-21-15, P. Block 401 | Fire Extinguishing Bottles |
| - 71-13-00, P. Block 301 | Cowl Doors |

(3)Procedure
(Ref. Fig. 501)
(a)Job set-up
1 Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | ENG1 & 2/SQUIB B/BTL 1 | 5WE | 207/C19 |
| 22VU | ENG1 & 2/SQUIB B/BTL 2 | 7WE | 207/C20 |
| 133VU | ENGINES/ENG1 & 2/FIRE EXTING/SQUIB A/BTL 1 | 1WE | 335/R71 |
| 133VU | ENGINES/ENG1 & 2/FIRE EXTING/SQUIB A/BTL 2 | 3WE | 335/R72 |

2 Open engine cowl doors (Ref. 71-13-00, P. Block 301).
3 Position access platforms at access doors 473AL (483AL) and 474AR (484AR).
4 Open access doors 473AL (483AL) and 474AR (484AR).
(b)Obstruction test
NOTE : If the fire extinguishing bottles are already removed, go to step 4.
1 Remove and discard the lockwire from the knurled nuts of the lines (3)

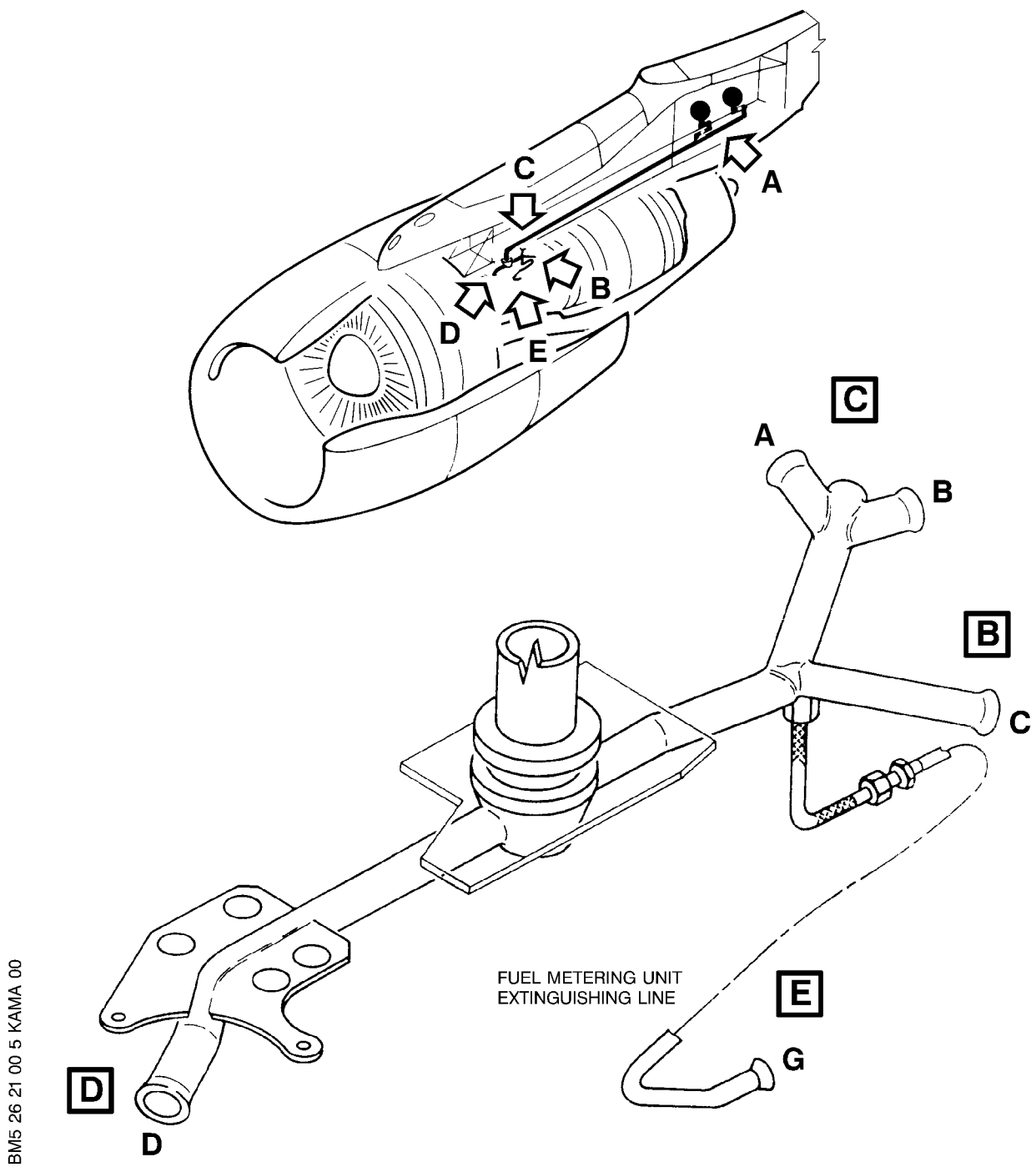
and (4).
2 Disconnect the lines (3) and (4) from the discharge heads (2) and (1). For the disconnection of the lines (3) and (4), see the removal of the discharge heads (Ref. 26-21-14, P. Block 401).
3 Move the engine fire extinguisher bottles to get access to the lines (3) and (4).
4 Connect the manifold assembly (9) (98A26203250113) to the pipe assy (10) (98A26203250114), connect the pipe assy (10) to the blank manifold (5) (98A26203250112) and connect the assembly to the outlet B (detail C).
5 Connect a compressed air source capable of 2.07 bars (30 psi) to the manifold assembly (9).
6 Open the air and make sure that air flows from the outlets A, (detail C), C (detail B), E, F (detail A), G (detail E) and D (detail D).
7 Shut off the compressed air source.

(c)Leak test

1 Install the plug assy (11) (98A26203250108) (detail F) on the outlets E and F (detail A).
2 Put the blanking plug (8) (98A26203250102) on the outlet D (detail D).
3 Put the two blank assies (6) (98A26203250100) on the outlets A (detail C) and C (detail B).
4 Put the blank assy (7) (98A26203250105) on the outlet G (detail E).
5 Pressurize the line to 2.07 bars (30 psi).
6 Shut off the valve of the manifold assembly (9) to isolate the extinguishing line.
NOTE : When the system is isolated, the line must be pressurized to 2.07 bars (30 psi).
7 After 5 minutes, make sure that there is no leakage. The pressure must not drop more than 0.13 bar (1.88 psi).
8 Shut off the compressed air source.
9 Open the drain valve to depressurize the extinguishing line.
10 Open the valve of the manifold assembly (9)
11 Disconnect the compressed air source from the manifold assembly (9).
12 Disconnect the manifold assembly (9) from the pipe (10), disconnect the pipe (10) from the blank manifold (5) and remove the blank manifold (5).
13 Remove the blank assies (6) and (7).
14 Remove the blanking plug (8).
15 If the bottles were already removed, install the engine fire extinguisher bottles (Ref. 26-21-15, P. Block 401).
16 If the bottles were not removed, remove the plug assy (11) and connect the lines (3) and (4) to the discharge heads (2) and (1). For the connection of the lines (3) and (4), see the installation of the discharge heads (Ref. 26-21-14, P. Block 401). Wirelock the knurled nuts of the lines (3) and (4).

(d)Close-up

1 Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

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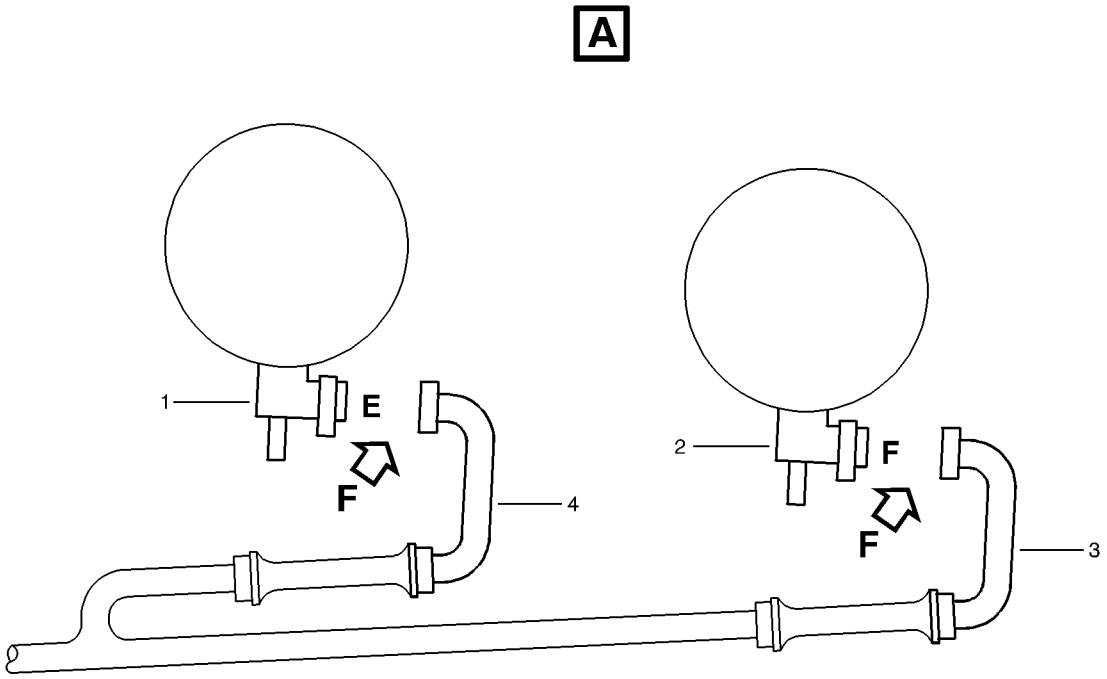
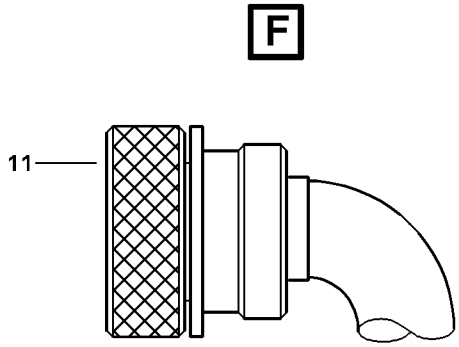
Distribution line
(Sheet 1/3)
Figure 501

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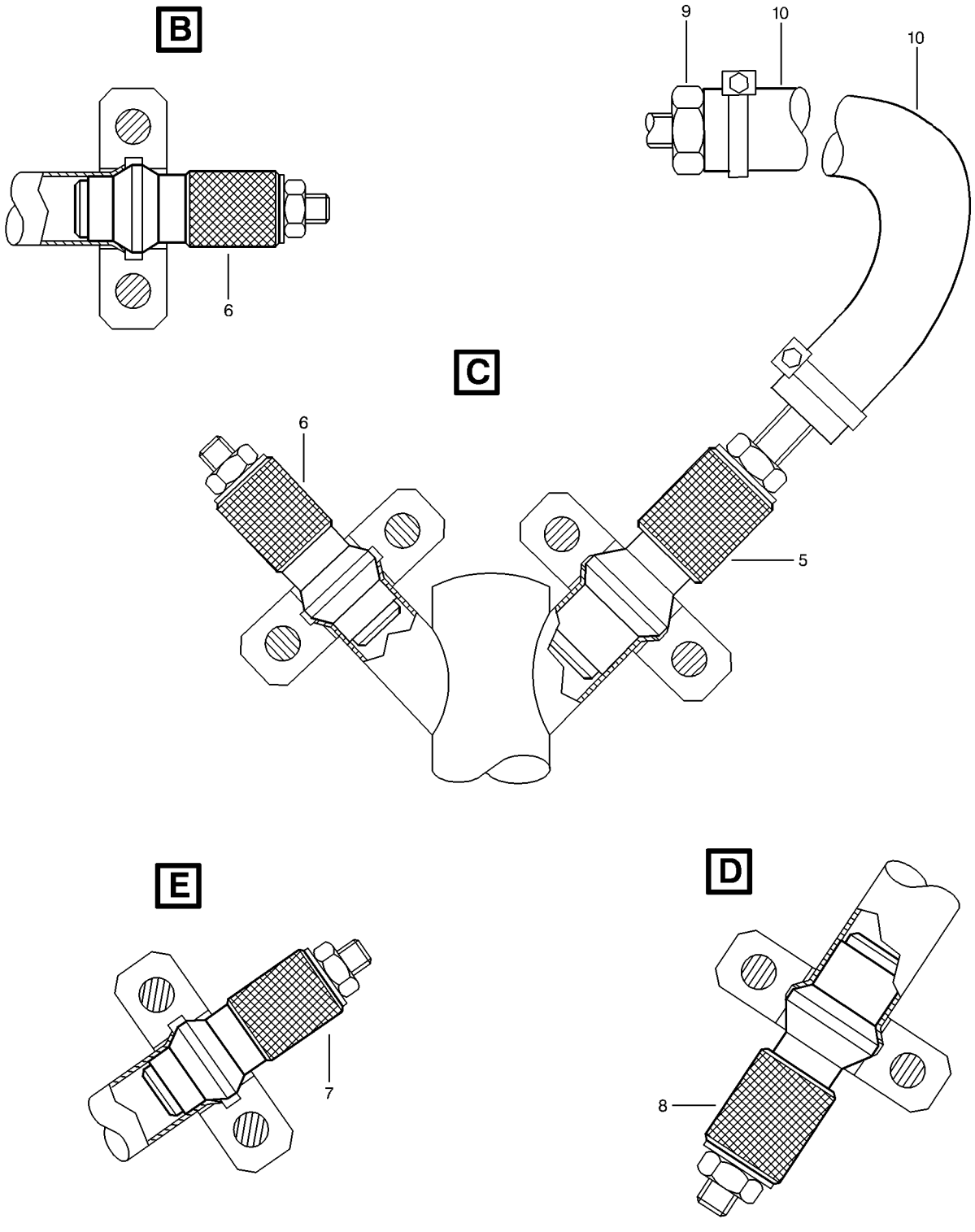
Distribution line
(Sheet 2/3)
Figure 501

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Distribution line
(Sheet 3/3)
Figure 501

2 Close access doors 473AL (483AL) and 474AR (484AR).
3 Remove access platforms and close engine cowl doors (Ref. 71-13-00, P. Block 301).
4 Close circuit breakers 1WE, 3WE, 5WE and 7WE.

1. Operational Test (SQUIB TEST)

A. Reason for the Job
Test of the discharge cartridges

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure

WARNING : BEFORE ATTEMPTING TEST, MAKE CERTAIN THAT ENG1 AND ENG2 FIRE HANDLES ARE IN PUSHED IN POSITION.

(1)Job set-up
(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that electronics racks ventilation is correct.
(c)If aircraft on ground : make certain that circuit breakers of engine fire extinguishing and engine fire detection circuits are closed.
(d)On ENG1 (ENG2) FIRE handle control module 39WD (40WD), make certain that AGENT1 and AGENT2 pushbutton switches are released.
(2)Test

| ACTION | RESULT |
|---|---|
| On ENG1 (ENG2) FIRE handle control module 39WD (40WD) | |
| - press SQUIB TEST pushbutton switch | On control module 39WD (40WD)<br>- SQUIB legend of AGENT1 pushbutton switch comes on<br>- SQUIB legend of AGENT2 pushbutton switch comes on |
| - release SQUIB TEST pushbutton switch | - SQUIB legend of AGENT1 pushbutton switch goes off<br>- SQUIB legend of AGENT2 pushbutton switch goes off. |

(3)Close-up
(a)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Restore system and aircraft to normal operating condition.

2. Operational Test

R A. Continuity Check of Electrical Percussion Circuit
(1)Reason for the Job
Make certain that the electrical circuits of ENG1 (ENG2) fire extin-

guisher bottle cartridges are in correct operating condition. The SQUIB TEST, carried out as part of the check list, does not make use of the same electrical circuit.

(2)Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (a) | Access Platform 4 m (13 ft. 1 in.) |
| (b) | Voltmeter |
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

(3)Procedure

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS ARE ISOLATED.

CAUTION : PULLING THE FIRE CONTROL HANDLE CAUSES LP FUEL, HYDRAULIC FIRE, BLEED AIR, ANTI ICE AND AIR CONDITIONING PACK VALVES TO CLOSE AND ALTERNATOR EXCITATION TO BE CUT OFF. THEREFORE, PRIOR TO PULLING THE HANDLE, MAKE CERTAIN THAT THIS WILL NOT INTERFERE WITH WORK BEING PERFORMED ON THE OTHER SYSTEMS.

(a)Job set-up

1 Install access platforms at access doors 473AL (483AL) and 474AR (484AR).

2 Open access doors 473AL (483AL) and 474AR (484AR).

3 Disconnect plug 23 (24) WE-A from bottle 1 and 25 (26) WE-A from bottle 2 in engine pylon.

4 Energize the aircraft electrical network. (Ref. 24-41-00, P. Block 301).

5 Make certain that electronics racks ventilation is correct.

6 If aircraft on ground : make certain that circuit breakers of engine fire extinguishing circuits are closed.

WARNING : CARTRIDGE ELECTRICAL PINS MUST BE SHUNTED WITH A PROTECTIVE SHUNT WHICH IS PROVIDED BY THE MANUFACTURER, A SHUNT PLUG OR SHORTING CLIP, TO PREVENT BOTTLE DISCHARGE WHICH COULD CAUSE INJURY TO MAINTENANCE PERSONNEL.

(b)Test

| ACTION | RESULT |
|---|---|
| 1. On ENG1 (ENG2) FIRE handle control module 39WD (40WD)<br>- pull ENG1 (ENG2) FIRE handle.<br>- press and hold LOOP TEST pushbutton switch for approx. 4 s. | On control module 39WD (40WD) single chime sounds.<br>- both SQUIB legends come on.<br>- both LOOP legends must be off.<br>- red warning light of ENG1 (2) FIRE handle comes on. |
| - release LOOP TEST pushbutton switch | - red warning light of ENG1 (2) FIRE handle goes off. |
| - press AGENT1/SQUIB DISCH pushbutton switch | - on disconnected cartridge connector plug 23 (24) WE-A, check for 28 Volts between terminal A and |

| ACTION | RESULT |
|---|---|
| | ground and between terminal B and ground. |
| - release AGENT1/SQUIB DISCH pushbutton switch | - check for zero volts between terminal A and ground and then terminal B and ground. |
| - press AGENT2/SQUIB DISCH pushbutton switch | - On disconnected cartridge connector plug 25 (26) WE-A, check for 28 Volts between terminal A and ground and between terminal B and ground. |
| - release AGENT2/SQUIB DISCH pushbutton switch | - check for zero volts between terminal A and ground and then terminal B and ground. |
| - push ENG1 (ENG2) FIRE handle in | - both SQUIB legends go off. |

WARNING : BEFORE INSTALLING CARTRIDGE CONNECTOR PLUG, REMOVE PROTECTIVE SHUNT, SHUNT PLUG OR SHORTING CLIP FROM CARTRIDGE ELECTRICAL PINS.
MAKE CERTAIN THAT THERE IS NO SHUNT BETWEEN THE PINS OF THE CARTRIDGE CONNECTOR PLUG.

(c)Close-up

1 On bottles 1 and 2, connect plugs to their respective cartridge connectors.
Perform operational test (SQUIB TEST) described in paragraph 1.C (2) to check correct connection of plugs 23, 24, 25, 26WE-A.
NOTE : If the following test is to be performed, carry on with paragraph B i.e. do not de-energize the aircraft electrical network.

2 Close access doors 473AL (483AL) and 474AL (484AR).

3 Remove access platforms.

4 Restore system and aircraft to normal operating condition.

B. Operational Test of Bottle Low Pressure Indicating Circuit by Actuating
R Test Screw on Pressure Switch

(1)Reason for the Job

To check correct operation of warning lights indicating a loss of pressure in engine fire extinguisher bottles.

(2)Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (a) | Allen Wrench 3/32 in. |
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

(3)Procedure

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT

ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS ARE ISOLATED.

(a)Job set-up

1 Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

2 Make certain that electronics racks ventilation is correct.

3 If aircraft on ground : make certain that circuit breakers of engine fire extinguishing circuits are closed.

4 On ENG1 (ENG2) FIRE handle control module 39WD (40WD).
- make certain that ENG1 (ENG2) FIRE handle is latched in pushed position.
- make certain that AGENT1 and AGENT2 pushbutton switches are released.

5 Open, safety and tag the following circuit breakers (for safety reason)

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | FIRE EXTING/ENG 1 & 2/BTL 1 | 5WE | 207/C19 |
| 22VU | FIRE EXTING/ENG 1 & 2/BTL 2 | 7WE | 207/C20 |

(b)Test

| ACTION | RESULT |
|---|---|
| 1 On fire extinguisher bottle 23WE (24WE), in L (R) engine pylon | |
| - engage Allen wrench in socket provided for this purpose in pressure switch. Turn wrench until stop is reached (approx. 1/4 turn) | On ENG1 (ENG2) FIRE control module 39WD (40WD)<br>- DISCH legend of AGENT1 pushbutton switch comes on. |
| - turn Allen wrench back to initial position | On control module 39WD (40WD)<br>- DISCH legend of AGENT1 pushbutton switch goes off |
| 2 On bottle 25WE (26WE) in L (R) engine pylon | |
| - engage Allen wrench in socket provided for this purpose in pressure switch. Turn wrench until stop is reached (approx. 1/4 turn). | On control module 39WD (40WD)<br>- DISCH legend of AGENT2 pushbutton switch comes on |
| - turn Allen wrench back to initial position | On control module 39WD (40WD)<br>- DISCH legend of AGENT2 pushbutton switch goes off |

(c)Close-up

1 De-energize the aircraft electrical network (Ref. 24-41-00, P. Block

301).
2 Restore system and aircraft to normal operating conditions.

C. Test of Engine Fire Extinguishing Lines
Refer to MPD Task 262100-03-02
WARNING : BEFORE BEGINNING THE TESTS, MAKE CERTAIN THAT THE TEST EQUIPMENT IS FURNISHED WITH A SAFETY SYSTEM ENABLING THE ABSORPTION OF ANY POSSIBLE OVERPRESSURE WHICH MIGHT DAMAGE THE FIRE EXTINGUISHING BOTTLES.
(1)Reason for the Job
To make certain that extinguishing lines do not leak or are not clogged.
(2)Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (a) | Access Platform |
| (b) | Lockwire |
| (c) | Pressure Gage - 0 to 5 bars (72.5 psi) |
| (d) | Air Supply, Pressure up to 2.07 bars (30 psi) |
| (e)98A26203250023 | Blanking Plug Set |
| Referenced Procedures | |
| - 26-21-14, P. Block 401 | Discharge Heads |
| - 26-21-15, P. Block 401 | Fire Extinguishing Bottles |
| - 71-13-00, P. Block 301 | Cowl Doors |

(3)Procedure
(Ref. Fig. 501)
(a)Job set-up
1 Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | FIRE EXTING/ENG1 & 2/SQUIB B/BTL1 | 5WE | 207/C19 |
| 22VU | FIRE EXTING/ENG1 & 2/SQUIB B/BTL2 | 7WE | 207/C20 |
| 133VU | ENGINES/ENG 1 & 2/FIRE EXTING/SQUIB A/BTL1 | 1WE | 335/R71 |
| 133VU | ENGINES/ENG 1 & 2/FIRE EXTING/SQUIB A/BTL2 | 3WE | 335/R72 |

2 Open engine cowl doors (Ref. 71-13-00, P. Block 301).
3 Position access platforms at access doors 473AL (483AL) and 474AR (484AR).
4 Open access doors 473AL (483AL) and 474AR (484AR).
(b)Obstruction test
NOTE : If the fire extinguishing bottles are already removed, go to step 4.
1 Remove and discard the lockwire from the knurled nuts of the lines (3) and (4).
2 Disconnect the lines (3) and (4) from the discharge heads (2) and (1). For the disconnection of the lines (3) and (4), see the removal of the discharge heads (Ref. 26-21-14, P. Block 401).
3 Move the engine fire extinguisher bottles to get access to the lines (3) and (4).

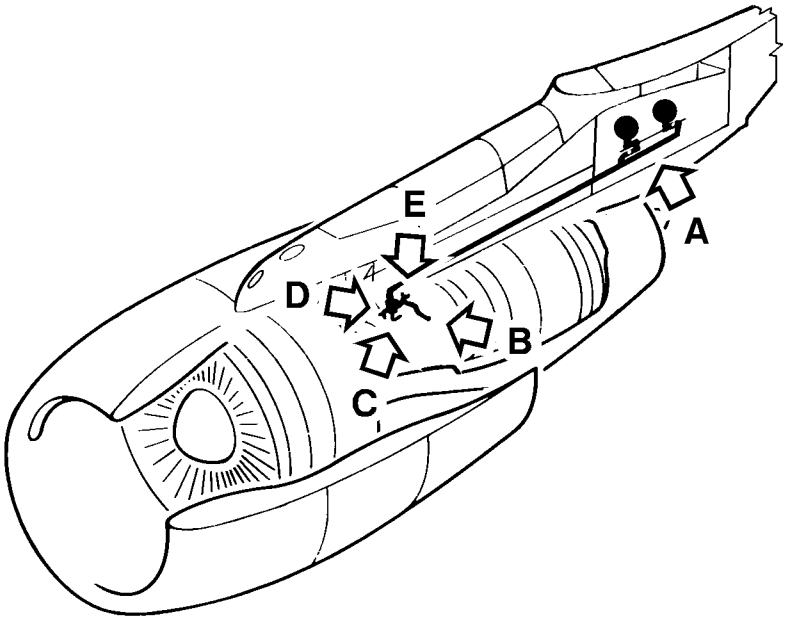
4 Connect the manifold assembly (12) (98A26203250113) to the pipe assy (13) (98A26203250114), connect the pipe assy (13) to the blank manifold (5) (98A26203250112) and connect the assembly to the outlet C (detail D).
5 Connect a compressed air source capable of 2.07 bars (30 psi) to the manifold assembly (12).
6 Open the air and make sure that air flows from the outlets D (detail D), I (detail B), G and H (detail E), A and B (detail C), E and F (detail A).
7 Shut off the compressed air source.

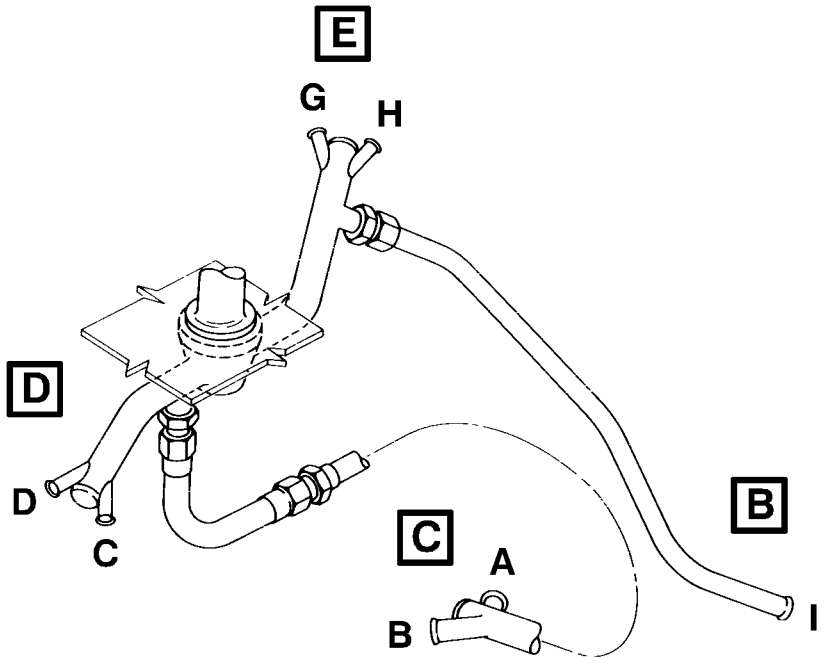
(c)Leak test

1 Install the plug assy (14) (98A26203250108) (detail F) on the outlets E and F (detail A).
2 Put the blank assy (6) (98A26203250100) on the outlet D (detail D).
3 Put the blank assy (7) (98A26203250100) on the outlet I (detail B).
4 Put the blank assy (8) (98A26203250100) on the outlet G (detail E).
5 Put the blank assy (9) (98A26203250101) on the outlet H (detail E).
6 Put the blank assy (10) (98A26203250103) on the outlet A (detail C).
7 Put the blank assy (11) (98A26203250103) on the outlet B (detail C).
8 Pressurize the line to 2.07 bars (30 psi).
9 Shut off the valve of the manifold assembly (12) to isolate the extinguishing line.
NOTE : When the system is isolated, the line must be pressurized to 2.07 bars (30 psi).
10 After 5 minutes, make sure that there is no leakage. The pressure must not drop more than 0.13 bar (1.88 psi).
11 Shut off the compressed air source.
12 Open the drain valve to depressurize the extinguishing line.
13 Open the valve of the manifold assembly (12).
14 Disconnect the manifold assembly (12), the pipe assy (13) and blank manifold (5) from the line.
15 Disconnect the pressurizing equipment from the manifold assembly (12) and remove blank assies (11), (10), (9), (8), (7), (6) and (14).
16 If the bottles were already removed, install the engine fire extinguisher bottles (Ref. 26-21-15, P. Block 401).
17 If the bottles were not removed, connect the lines (3) and (4) to the discharge heads (2) and (1).
For the connection of the lines (3) and (4), see the installation of the discharge heads (Ref. 26-21-14, P. Block 401).
Wirelock the knurled nuts of the lines (3) and (4).

(d)Close-up

1 Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
2 Close access doors 473AL (483AL) and 474AR (484AR).
3 Remove access platforms and close engine cowl doors (Ref. 71-13-00, P. Block 301).
4 Close circuit breakers 1WE, 3WE, 5WE and 7WE.

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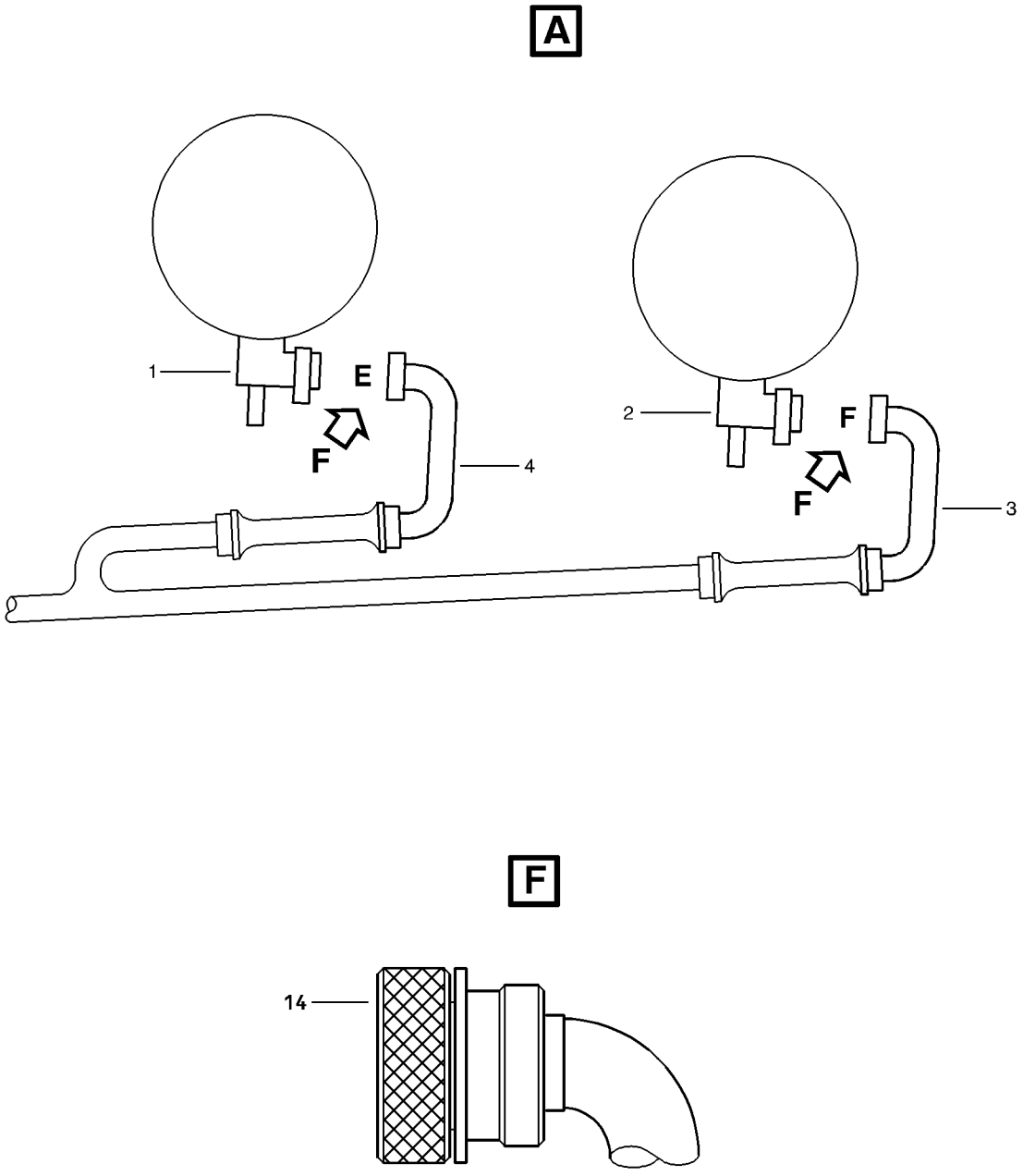
Distribution line
(Sheet 1/3)
Figure 501

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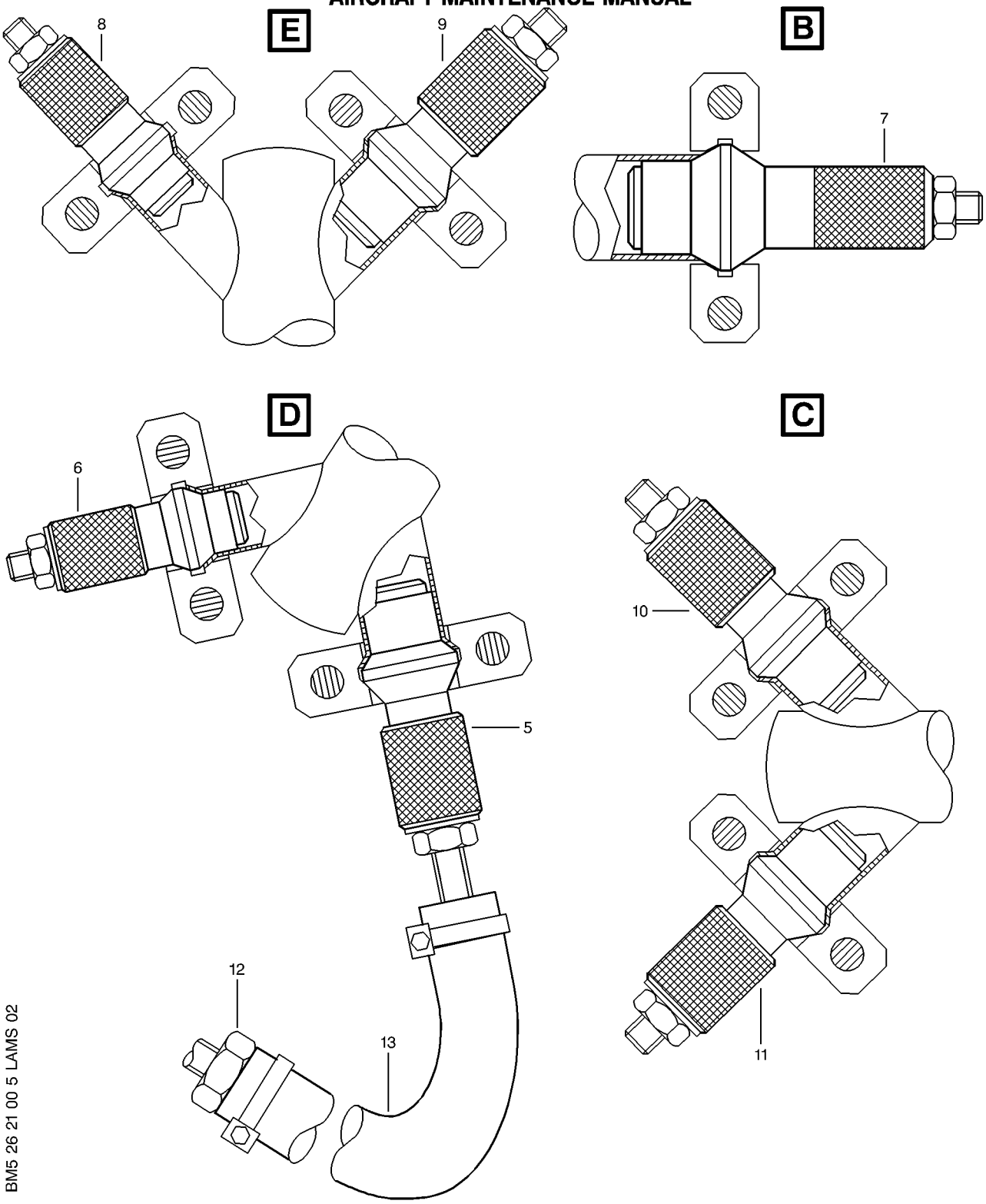
Distribution line
(Sheet 2/3)
Figure 501




Distribution line
(Sheet 3/3)
Figure 501

R Ref. : MMEL Sect. 1-26, Item 16 A (ENG. SQUIB TEST)
CAUTION : THIS PROCEDURE IS TO BE USED ACCORDING TO THE REQUIREMENTS OF THE MMEL.

WARNING : BEFORE ATTEMPTING TEST, MAKE CERTAIN THAT ENG1 AND ENG2 FIRE HANDLES ARE IN PUSHED POSITION.

1. Deactivation

A. Reason for the Job
ENG SQUIB TEST is inoperative :
- check if the test circuit only is failed.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure
- Connect electrical power supply.
R - Make certain that circuit breakers of engine fire extinguishing and
R engine fire detection circuits are closed.
- Disconnect plug associated with failed SQUIB TEST.
Circuit : - 23(24) WE-A from bottle 1, ENG 1(2)
- 25(26) WE-A from bottle 2, ENG 1(2)
- Connect terminals A and B of involved connector plug to earth :
WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS ARE ISOLATED.

CAUTION : PULLING THE FIRE CONTROL HANDLE CAUSES LP FUEL, HYDRAULIC FIRE, BLEED AIR, ANTI-ICE AND AIR CONDITIONING PACK VALVES TO CLOSE AND GENERATOR TO BE CUT OFF. THEREFORE, PRIOR TO PULLING THE HANDLE, MAKE CERTAIN THAT THIS WILL NOT INTERFERE WITH WORK BEING PERFORMED ON THE OTHER SYSTEMS.
- Connect terminals A and B of involved connector plug :
23 WE-A for agent 1, ENG 1
24 WE-A for agent 1, ENG 2
25 WE-A for agent 2, ENG 1
26 WE-A for agent 2, ENG 2
to ground
- Perform the following test

| ACTION | RESULT |
|---|---|
| R On ENG1 (ENG2) FIRE handle control<br>R module 39WD (40WD) : | On control module 39WD (40WD) : |

| ACTION | RESULT |
|---|---|
| - Press **SQUIB TEST** pushbutton switch | - **Both SQUIB** legends (for **ENG**) come on. |
| - Release **SQUIB TEST** pushbutton switch | - **SQUIB** legends go off. |

If test is **OK**, squib(s) is (are) faulty and must be cleared.
If not **OK** (one **SQUIB** legend (for **ENG**) remains off, it is recommended to perform following tests to ensure integrity of firing system.

| ACTION | RESULT |
|---|---|
| R On **ENG1 (ENG2) FIRE** handle control module **39WD (40WD)** : | |
| - Pull **ENG 1 (or 2) FIRE** handle | - **Disregard SQUIB** legends and all other subsequent consequences |
| - Press associated **AGENT** pushbutton switch (and keep it pressed) | - In pylon area check **28VDC** between **A** and earth plus **B** and earth of associated connector plug. |
| - Release **AGENT** pushbutton switch | |

If test is **OK**, firing system is **OK**, squib test system is faulty, aircraft **CAN BE RELEASED.**
If not **OK** (no voltage), firing system must be cleared.
- Connect plug
  **CAUTION : MAKE CERTAIN THAT THE CONNECTOR IS CORRECTLY INSERTED AND SAFETIED.**
- Restore system and aircraft to normal operating condition.

2. Reactivation
Refer to **TSM** 26-21-00

ENG. AGENT 1 & 2 "DISCH" LIGHT

Ref. : MMEL Sect. 1-26, Item 4 (AGENT 182 "DISH" lt.)

FIRE EXTINGUISHER BOTTLE WEIGHT CHECK, PRIOR TO FIRST FLIGHT OF EACH DAY.

A. Reason for the Job

- weight check for engine fire extinguisher bottle
- perform a SQUIB TEST.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| Referenced Procedures | |
| R - 26-21-00, P. Block 501 | Engine Fire Extinguishing |
| R - 26-21-15, P. Block 401 | Fire Extinguisher Bottle |

C. Procedure

(1)Remove fire extinguisher bottle (Ref. 26-21-15, P. Block 401).

(2)Weight fire extinguisher bottle.

NOTE : Check that gross weight of fire extinguisher bottle is within ± 0.1 lb. (± 0.045 kg) of the weight recorded on the manufacturer's name plate.

NOTE : Weight check is not necessary if NATIONAL REQUIREMENTS are fulfilled.

NOTE : The gross weight of the fire extinguisher bottle not includes discharge head and cartridge weights. The extinguisher bottle must be rejected if gross weight is not within the stated tolerance.

(3)Install fire extinguisher bottle (Ref. 26-21-15, P. Block 401).

(4)Perform SQUIB Test (Ref. 26-21-00, P. Block 501).

DISCHARGE CARTRIDGE - REMOVAL/INSTALLATION

WARNING : BEFORE YOU SUPPLY ELECTRICAL POWER TO THE AIRCRAFT, MAKE SURE THAT ALL THE CIRCUITS IN MAINTENANCE ARE ISOLATED. UNWANTED ELECTRICAL POWER CAN BE DANGEROUS.

R WARNING : WHEN CARTRIDGE ELECTRICAL CONNECTORS ARE DISCONNECTED, CARTRIDGE
R ELECTRICAL PINS MUST BE SHUNTED WITH PROTECTIVE SHUNT, SHUNT PLUG OR SHORTING CLIP, TO PREVENT BOTTLE DISCHARGE WHICH COULD CAUSE INJURY TO MAINTENANCE PERSONNEL.

WARNING : THE CARTRIDGE INSTALLED MUST BE OF THE SAME MAKE AS THE FIRE EXTINGUISHER BOTTLE AND CORRESPOND TO THE SPECIFICATION INDICATED IN THE TABLE BELOW :

| MAKE | EXTINGUISHER BOTTLE P/N | DISCHARGE HEAD P/N | DISCHARGE CARTRIDGE P/N |
|---|---|---|---|
| WALTER KIDDE | A 813600-16 | A 813650-4 | 805300-12 |

NOTE : Cartridge installation procedure is identical for each of the four extinguisher bottles.

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| R A. 325344 | Shunt, Plug - Fire Extinguisher Cartridge |
| R B. | Protective Cap (if Supplied by Bottle Vendor) |
| R C. | Access Platform 13ft.(4m) |
| R D. | Torque Wrench Adjustable from 150 to 200 lbf. in. (12.5 to 16.7 lbf.ft.) (1.70 to 2.26 m. daN) |
| R E. Material No. 11-004 | Cleaning Agents (Ref. 20-31-00) |

R

Referenced Procedures

| | |
|---|---|
| - 21-21-00, P. Block 1 | Flight Compartment and Electronics Racks Air Distribution |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 26-21-00, P. Block 501 | Engine Fire Extinguishing |

2. Procedure

A. Job Set-Up

(1)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301). Make certain that electronics racks are ventilated (Ref. 21-21-00, P. Block 1).

(2)Install access platforms at access doors 473AL (483AL) and 474AR (484AR).

(3)Open access doors 473AL (483AL) and 474AR (484AR).

(4)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 133VU | ENG1 and 2/FIRE EXTING/SQUIB A/BTL 1 | 1WE | 335/R71 |
| 133VU | ENG1 and 2/FIRE EXTING/SQUIB A/BTL 2 | 3WE | 335/R72 |
| 22VU | ENG1 and 2/SQUIB B/BTL 1 | 5WE | 207/C19 |
| 22VU | ENG1 and 2/SQUIB B/BTL 2 | 7WE | 207/C20 |

B. Removal

**ON A/C 001-100,

(Ref. Fig. 401)

**ON A/C 101-200,

(Ref. Fig. 402)

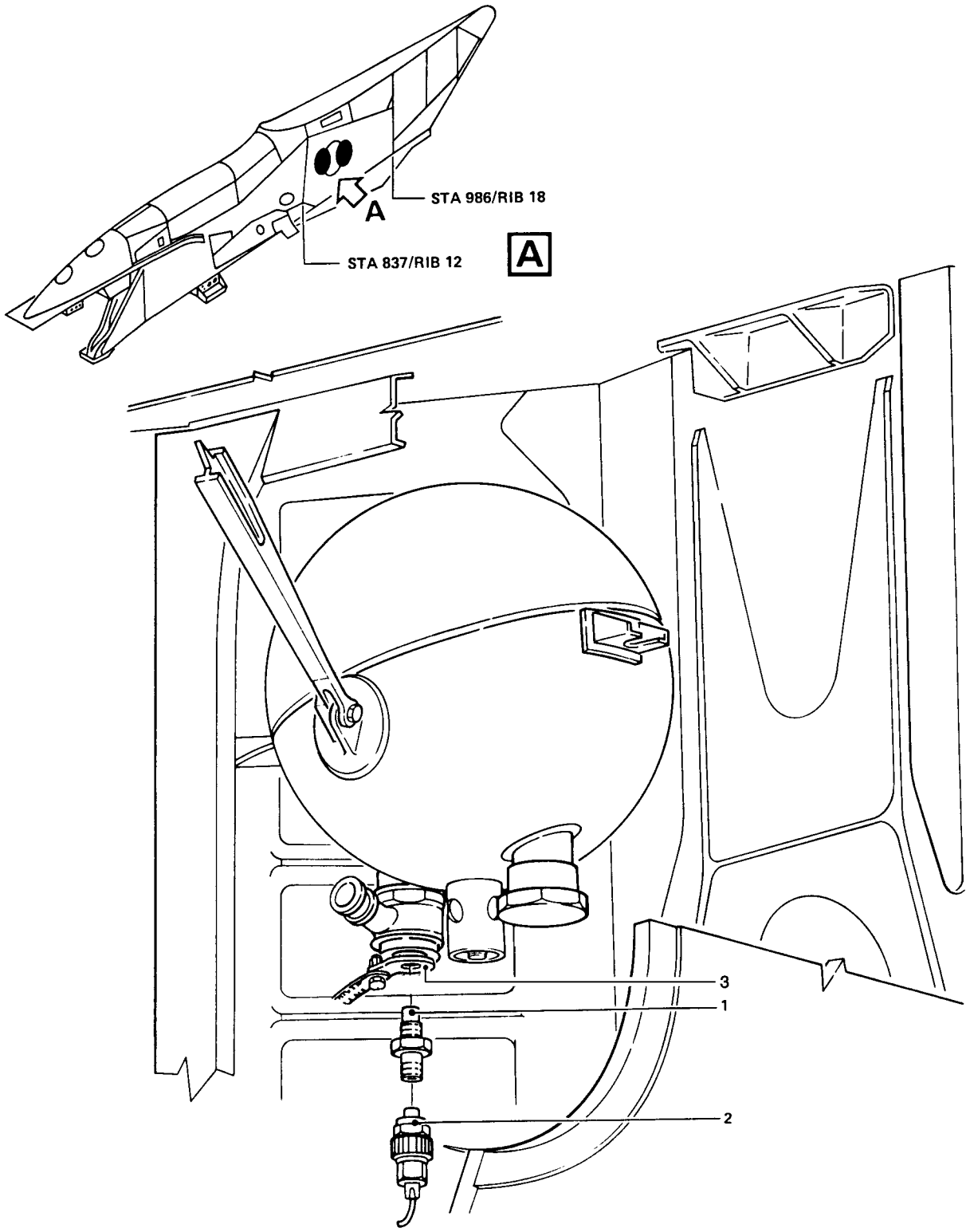
**ON A/C ALL

R (1)Disconnect cartridge electrical supply connector (2) from discharge
R cartridge (1).
R WARNING : WHEN CARTRIDGE ELECTRICAL CONNECTORS ARE DISCONNECTED,
R CARTRIDGE ELECTRICAL PINS MUST BE SHUNTED WITH PROTECTIVE
R SHUNT, SHUNT PLUG OR SHORTING CLIP, TO PREVENT BOTTLE DISCHARGE
R WHICH COULD CAUSE INJURY TO MAINTENANCE PERSONNEL.
R (2)Install fire extinguisher cartridge shunt plug 325344 or protective cap
R (if supplied by vendor) to discharge cartridge electrical connector (1).
(3)Unscrew discharge cartridge (1).
(4)Cap cartridge ends and fire extinguisher bottle discharge head with protective caps (supplied by bottle vendor).

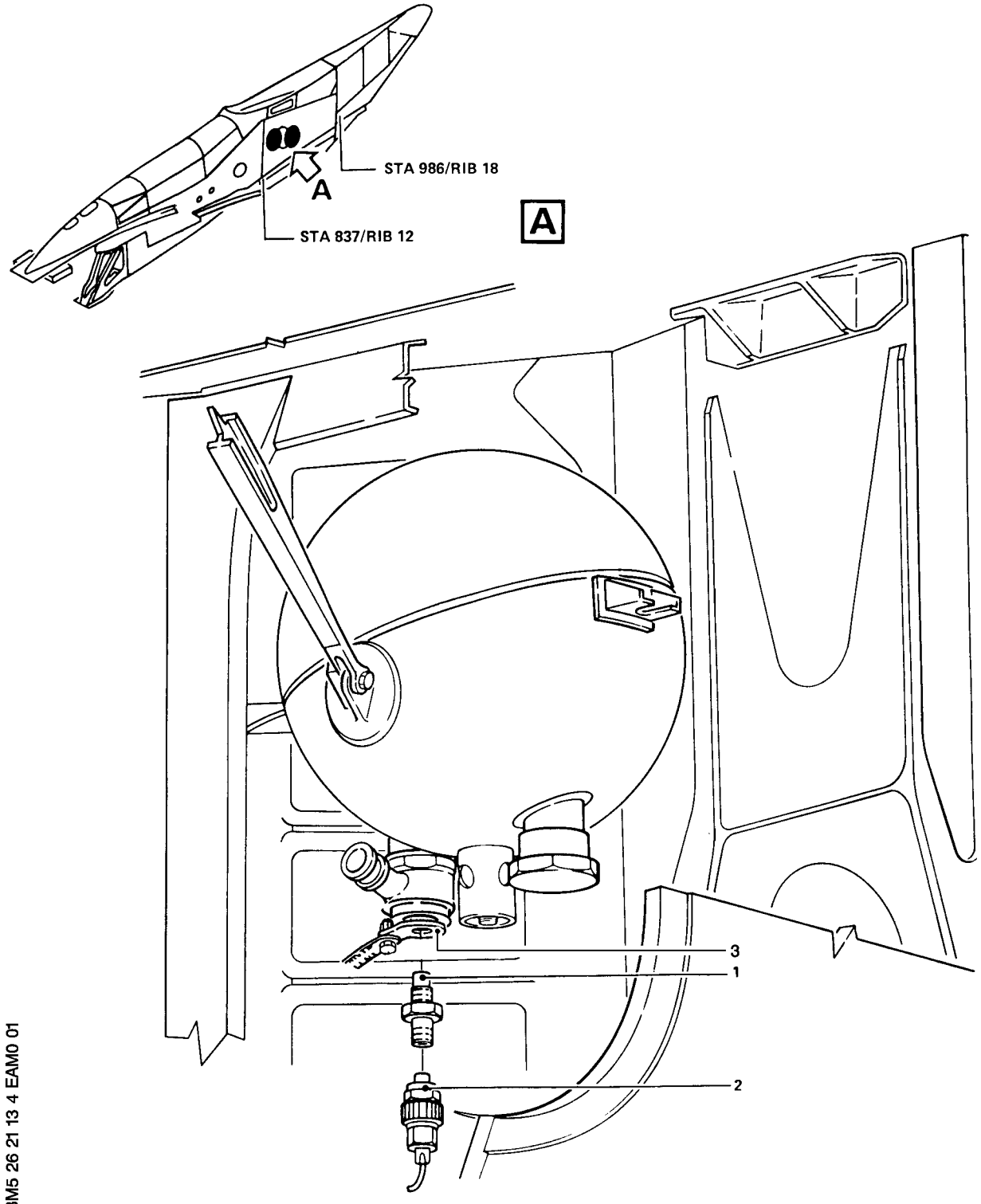
C. Cleaning
(1)Clean cartridge with Material 11-004B, rub slightly and dry with a clean lint-free cloth.
WARNING : MATERIAL No.11-004B IS A COMBUSTIBLE MIXTURE, WHICH IS HARMFUL OR FATAL IF SWALLOWED. KEEP AWAY FROM HEAT OR OPEN FLAME. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN USE IN WELL VENTILATED AREA.

D. Preparation of Replacement Component
(1)Check cartridge visually
(2)Make certain that thread and electrical connector of replacement cartridge are in good condition.
(3)Check the manufacturing date on the replacement cartridge. Make sure that the maximum combination storage plus service life limit will extend to the next scheduled inspection and in accordance with vendor recommendation.

E. Installation
WARNING : MAKE CERTAIN BEFORE INSTALLATION THAT :




Engine Fire Extinguisher Bottle
Figure 401

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Engine Fire Extinguisher Bottle
Figure 402

R

- THE CARTRIDGE IS NOT BLANKED BY A METALLIC DIAPHRAGM OR PROTECTIVE CAP
- THE PINS OF THE ELECTRICAL PLUG ARE NOT SHUNTED.

(1)Uncap cartridge ends and fire extinguisher bottle discharge head.
(2)Position eye end (3) and bonding strip assembly on discharge head.
(3)Position and screw in cartridge (1), maintain eye end (3) in its position and TORQUE to between 150 and 200 lbf.in. (1.70 and 2.26 m.daN).
R WARNING : BEFORE INSTALLING CARTRIDGE CONNECTOR PLUG, REMOVE PROTECTIVE
R SHUNT, SHUNT PLUG OR SHORTING CLIP FROM CARTRIDGE ELECTRICAL
R PINS.
R MAKE CERTAIN THAT THERE IS NO SHUNT BETWEEN PINS OF CARTRIDGE
R CONNECTOR PLUG.
R (4)Remove fire extinguisher cartridge shunt plug 325344 or protective cap
R (if supplied by vendor) from discharge cartridge electrical connector
R (1).
R (5)Connect cartridge electrical connector (2) to discharge cartridge (1).

F. Test

WARNING : BEFORE ATTEMPTING TESTS MAKE CERTAIN THAT ENG1 FIRE AND EN2 FIRE HANDLES LOCATED ON CONTROL MODULES 39WD AND 40WD ARE IN NORMAL (PUSHED) POSITION.

(1)Make certain that the following circuit breakers are closed :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 133VU | ENGINES/ENG 1 & 2/FIRE EXTING/SQUIB A/ BTL 1 | 1WE | 335/R71 |
| 133VU | ENGINES/ENG 1 & 2/FIRE EXTING/SQUIB A/ BTL 2 | 3WE | 335/R72 |
| 22VU | ENG1 and 2/SQUIB B/BTL 1 | 5WE | 207/C19 |
| 22VU | ENG1 and 2/SQUIB B/BTL 2 | 7WE | 207/C20 |

(2)Carry out operational test of the squib system (Ref. 26-21-00, P. Block 501).

G. Close-Up

(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Close access doors 473AL (483AL) and 474AR (484AR).
(3)Remove access platforms
(4)De-energize the aircraft electrical network, (Ref. 24-41-00, P. Block 301).

WARNING : AS THE CARTRIDGES ARE EXPLOSIVE, REMOVE THEM BEFORE WORKING ON THE CONTAINER. PROTECTIVE CAPS MUST BE INSTALLED DURING HEAD REMOVAL/ INSTALLATION TO PREVENT DAMAGE TO DISCHARGE DIAPHRAGM WHICH COULD RESULT IN INJURY TO PERSONNEL.

R WARNING : WHEN CARTRIDGE ELECTRICAL CONNECTORS ARE DISCONNECTED, CARTRIDGE ELECTRICAL PINS MUST BE SHUNTED WITH PROTECTIVE SHUNT, SHUNT PLUG OR SHORTING CLIP, TO PREVENT BOTTLE DISCHARGE WHICH COULD CAUSE INJURY TO MAINTENANCE PERSONNEL.

NOTE : The engine fire extinguishing system comprises two heads in RH pylon and two heads in LH pylon. As installation of the four heads is identical, only one Removal/Installation procedure is dealt with in this topic.

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| R A. 325344 | Shunt, Plug - Fire Extinguisher Cartridge |
| R B. | Protective Cap (if Supplied by Bottle Vendor) |
| R C. | Access Platforms 4m (13 ft. 12 in.) |
| R D. | O-Ring |
| R E. | Torque Wrench 480-580 lbf.in. (5.42-6.55 m.daN) |
| R | |
| Referenced Procedure<br>- 26-21-00, P. Block 501 | Engine Fire Extinguishing |

2. Procedure

A. Job Set-Up
(1)Install access platform at access doors 473AL (483AR) and 474AR (484AR)
(2)Open access doors 473AL (483AL) and 474AR (484AR)
(3)Open, safety and tag the following circuit breakers :

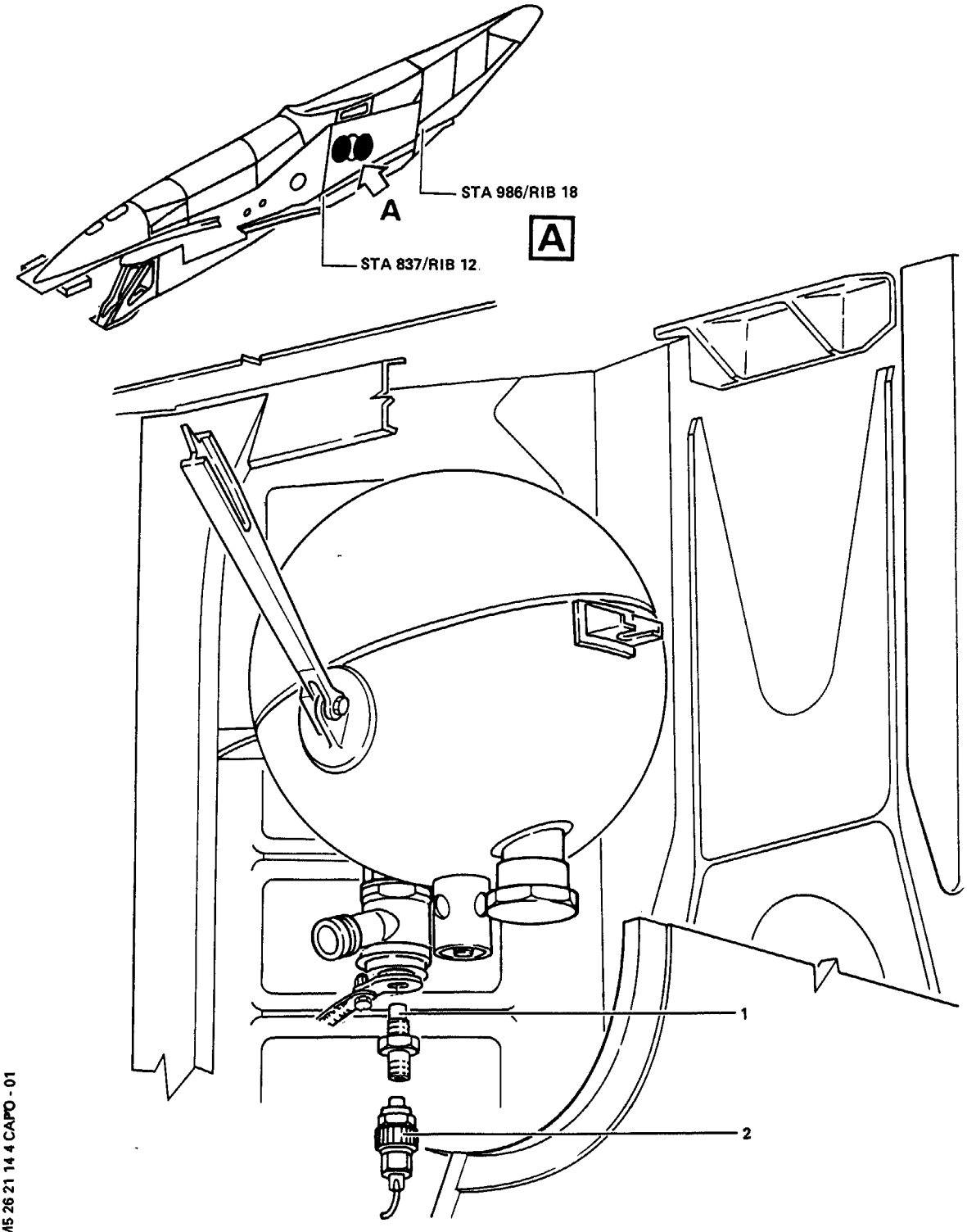
| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 133VU | ENG1 and 2/FIRE EXTING/SQUIB A/BTL 1 | 1WE | 335/R71 |
| 133VU | ENG1 and 2/FIRE EXTING/SQUIB A/BTL 2 | 3WE | 335/R72 |
| 22VU | ENG1 and 2/SQUIB B/BTL 1 | 5WE | 207/C19 |
| 22VU | ENG1 and 2/SQUIB B/BTL 2 | 7WE | 207/C20 |

B. Removal

**ON A/C 001-100,

(Ref. Fig. 401)

**ON A/C 101-200,




Disconnection of System Component From Discharge Head
Figure 401

(Ref. Fig. 402)
(Ref. Fig. 403)

**ON A/C 001-100,

(Ref. Fig. 404)

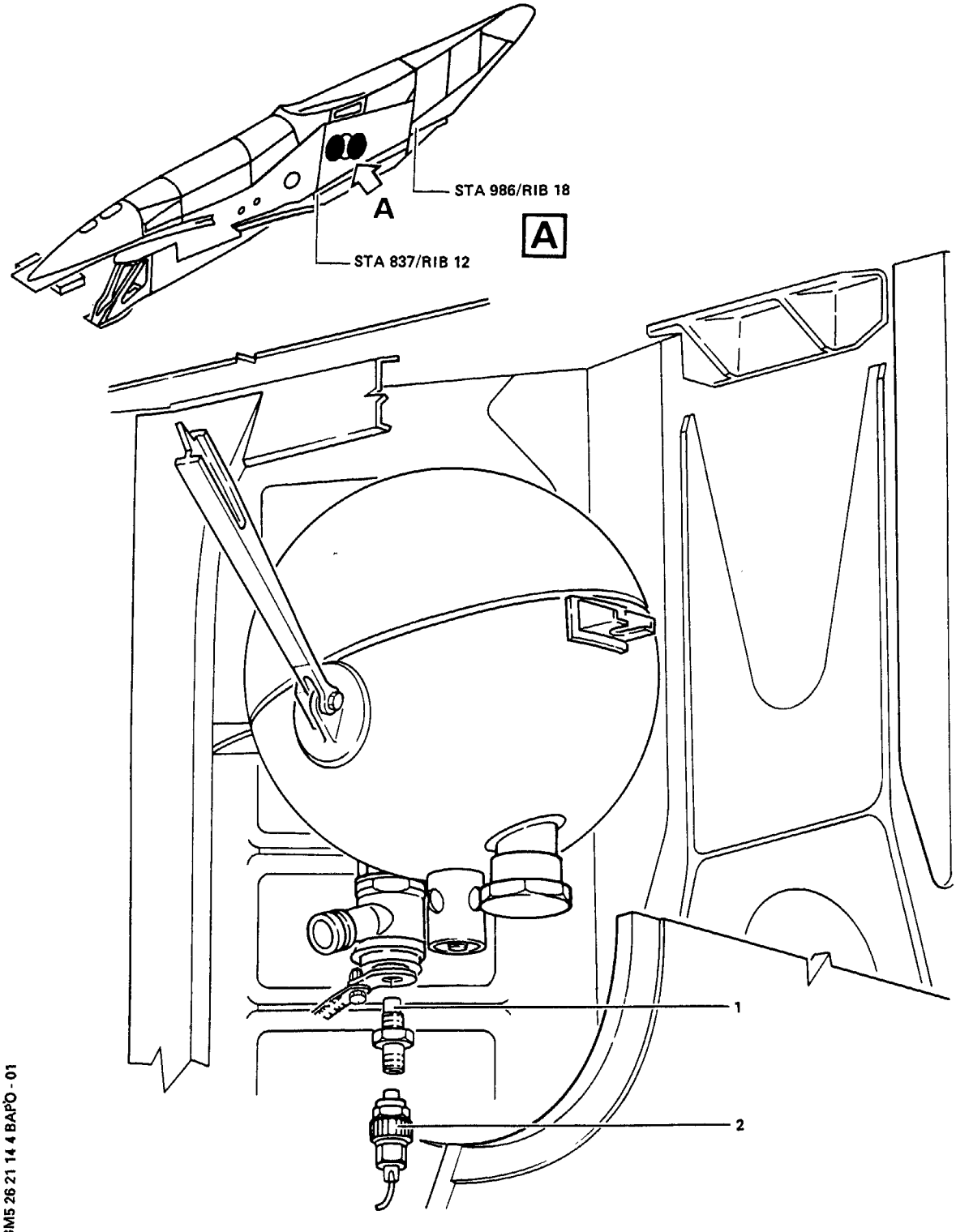
**ON A/C ALL

R (1)Disconnect cartridge electrical supply connector (2) from discharge
R cartridge (1).
R WARNING : WHEN CARTRIDGE ELECTRICAL CONNECTORS ARE DISCONNECTED,
R CARTRIDGE ELECTRICAL PINS MUST BE SHUNTED WITH PROTECTIVE
R SHUNT, SHUNT PLUG OR SHORTING CLIP, TO PREVENT BOTTLE DISCHARGE
R WHICH COULD CAUSE INJURY TO MAINTENANCE PERSONNEL.
R (2)Install fire extinguisher cartridge shunt plug 325344 or protective cap
R (if supplied by vendor) to discharge cartridge electrical connector (1).
(3)Loosen knurled cap (3) by pulling back and turning by hand. Do not use any tool. Disengage line (4). Cap line open end.
(4)Hold discharge head (5) and completely untighten nut (6).
(5)Remove discharge head.
(6)Secure protective cap (supplied by bottle vendor) onto fire extinguisher bottle with nut (6).
(7)Remove percussion cartridge (1), from discharge head (5) shunt pins and cap each end.
WARNING : THE CLOSURE END MUST BE AIMED AWAY FROM PERSONNEL AND DOWNWARD TOWARDS THE FLOOR TO PREVENT INJURY TO PERSONNEL FROM FRAGMENTS IN CASE OF ACCIDENTAL FIRING.
(8)Remove strainer (8) from discharge head (5) body.
(9)Remove and discard O-ring(s) (9) from discharge head end.

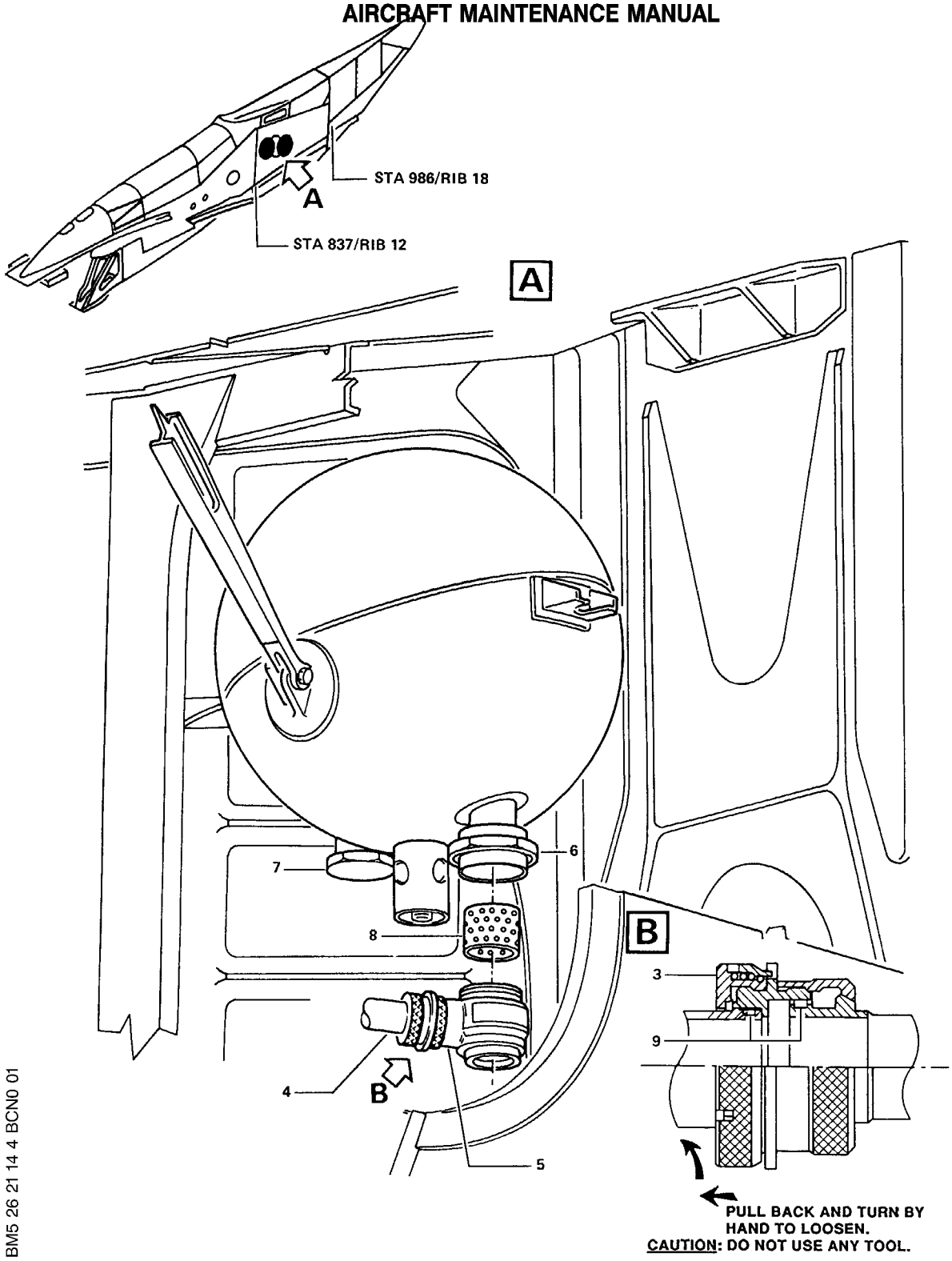
C. Cleaning
(1)Clean strainer (8) and discharge head body with a mild detergent diluted in hot water.
(2)Dry with a low pressure (5 to 10 psi (0.35 to 0.69 bar)) compressed air source.

D. Check
(1)Carry out a visual check of the discharge head (5) and make certain in particular that :
- body and strainer do not show traces of wear
- head is free from corrosion, cracks or structural defects.

E. Installation
(1)Install new O-ring(s) (9) on discharge head end.
(2)Install strainer (8) into discharge head (5) body.
CAUTION : MAKE CERTAIN THAT CONNECTING PART OF STRAINER (8) IS INSTALLED OPPOSITE DISCHARGE HEAD OUTLET.
(3)Uncap and install percussion cartridge (1) on discharge head (5), TORQUE to between 150 and 200 lbf.in. (1.7 and 2.25 m.daN).
(4)Remove protective cap (supplied by bottle vendor) from fire extinguisher




Disconnection of System Component From Discharge Head
Figure 402

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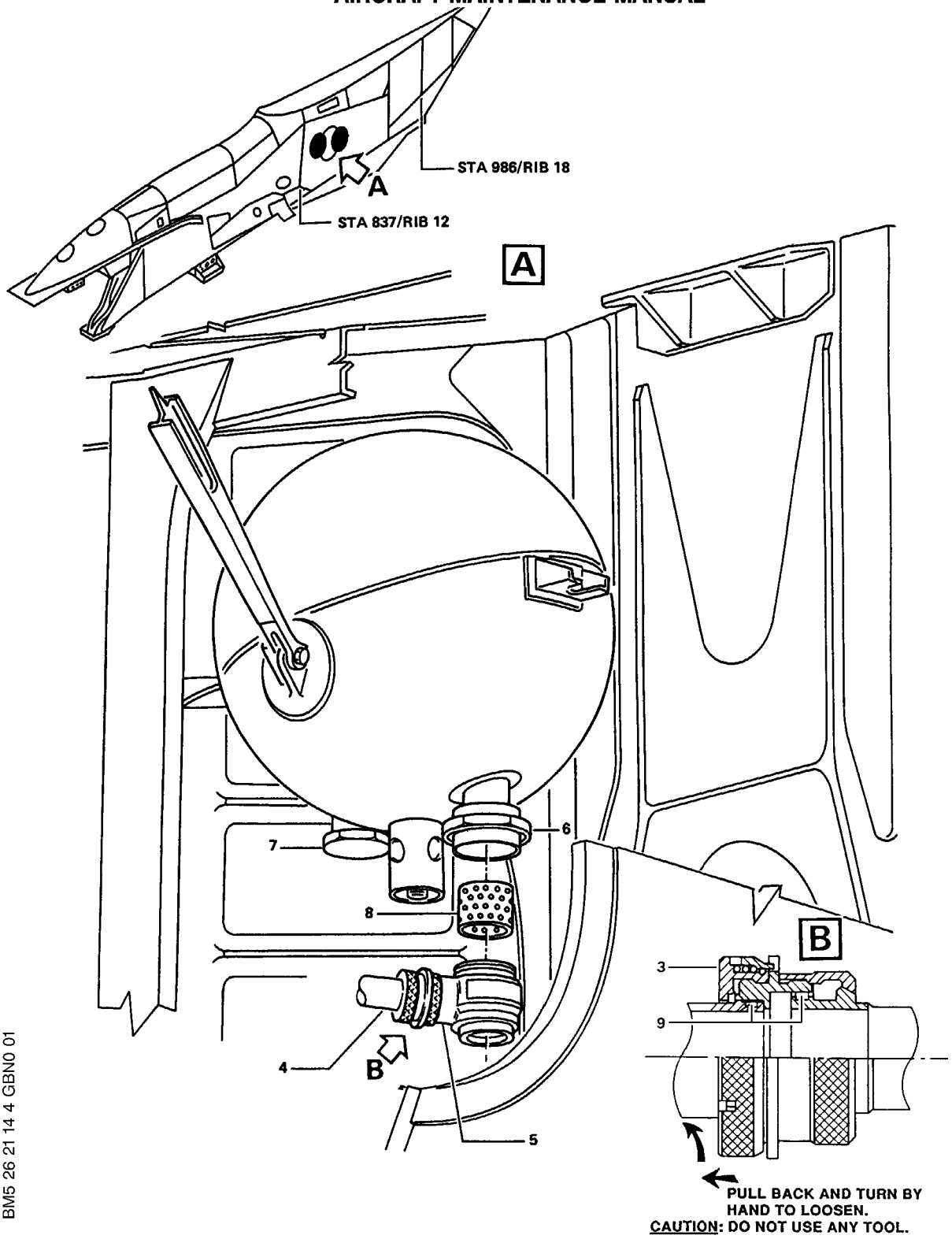
Removal of Discharge Head
Figure 403

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Removal of Discharge Head
Figure 404

bottle with nut (6).
(5)Uncap and install discharge head (5) under the bottle and screw nut (6) without tightening.
(6)Uncap fire extinguisher line (4).
(7)Position discharge head end in line with fire extinguisher line (4).
(8)Hand tighten knurled nut (3) on discharge head (5).
(9)TORQUE nut (6) on discharge head to between 480 and 580 lbf. in. (5.42 and 6.55 m.daN).
R WARNING : BEFORE INSTALLING CARTRIDGE CONNECTOR PLUG, REMOVE PROTECTIVE
R SHUNT, SHUNT PLUG OR SHORTING CLIP FROM CARTRIDGE ELECTRICAL
R PINS.
R MAKE CERTAIN THAT THERE IS NO SHUNT BETWEEN PINS OF CARTRIDGE
R CONNECTOR PLUG.
R (10)Remove fire extinguisher cartridge shunt plug 325344 or protective cap
R (if supplied by bottle vendor) from discharge cartridge electrical
R connector (1).
R (11)Connect cartridge electrical supply connector (2) to discharge cartridge
R (1).

F. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Perform a squib test of the fire extinguisher bottles (Ref. 26-21-00, P. Block 501).
(3)Close access doors 473AL (483AL) and 474AR (484AR).
(4)Remove access platforms
(5)Remove safety clips and tags and close circuit breakers 1WE, 3WE, 5WE, and 7WE.

WARNING : AS THE CARTRIDGES ARE EXPLOSIVE, REMOVE THEM BEFORE WORKING ON THE CONTAINER. PROTECTIVE CAPS MUST BE INSTALLED DURING BOTTLE REMOVAL/ INSTALLATION TO PREVENT DAMAGE TO DISCHARGE DIAPHRAGM WHICH COULD RESULT IN INJURY TO PERSONNEL.

R WARNING : WHEN CARTRIDGE ELECTRICAL CONNECTORS ARE DISCONNECTED, CARTRIDGE
R ELECTRICAL PINS MUST BE SHUNTED WITH PROTECTIVE SHUNT, SHUNT PLUG
R OR SHORTING CLIP, TO PREVENT BOTTLE DISCHARGE WHICH COULD CAUSE INJURY
R TO MAINTENANCE PERSONNEL.

NOTE : The engine fire extinguishing system comprises two bottles in RH pylon and two bottles in LH pylon. As installation of the four bottles is identical, only one Removal/Installation procedure is dealt with in this topic.

1. Equipment and Material

| | ITEM | DESIGNATION |
|---|---|---|
| R | A. 325344 | Shunt, Plug - Fire Extinguisher Cartridge |
| R | B. | Protective Cap (if Supplied by Bottle Vendor) |
| R | C. | Access Platform 4 m (13 ft. 12 in.) |
| R | D.98A26201000000 | Equipment-Removal/Installation, Engine Fire Extinguisher |
| R | E. | Allen Wrench 3/32 in. |
| | Referenced Procedures | |
| | - 21-21-00, P. Block 301 | Flight Compartment and Electronics Racks Air Distribution |
| | - 24-41-00, P. Block 301 | AC External Power Control |
| | - 26-21-13, P. Block 401 | Discharge Cartridge |
| | - 26-21-14, P. Block 401 | Discharge Head |

2. Procedure

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers :

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 133VU | ENG1 & 2/FIRE EXTING/SQUIB A/BTL 1 | 1WE | 335/R71 |
| 133VU | ENG1 & 2/FIRE EXTING/SQUIB A/BTL 2 | 3WE | 335/R72 |
| 22VU | ENG1 & 2/FIRE EXTING/SQUIB B/BTL 1 | 5WE | 207/C19 |
| 22VU | ENG1 & 2/FIRE EXTING/SQUIB B/BTL 2 | 7WE | 207/C20 |

(2)Install access platforms at engine pylon.

(3)Open access doors 473AL and 474AR (483AL and 484AR).

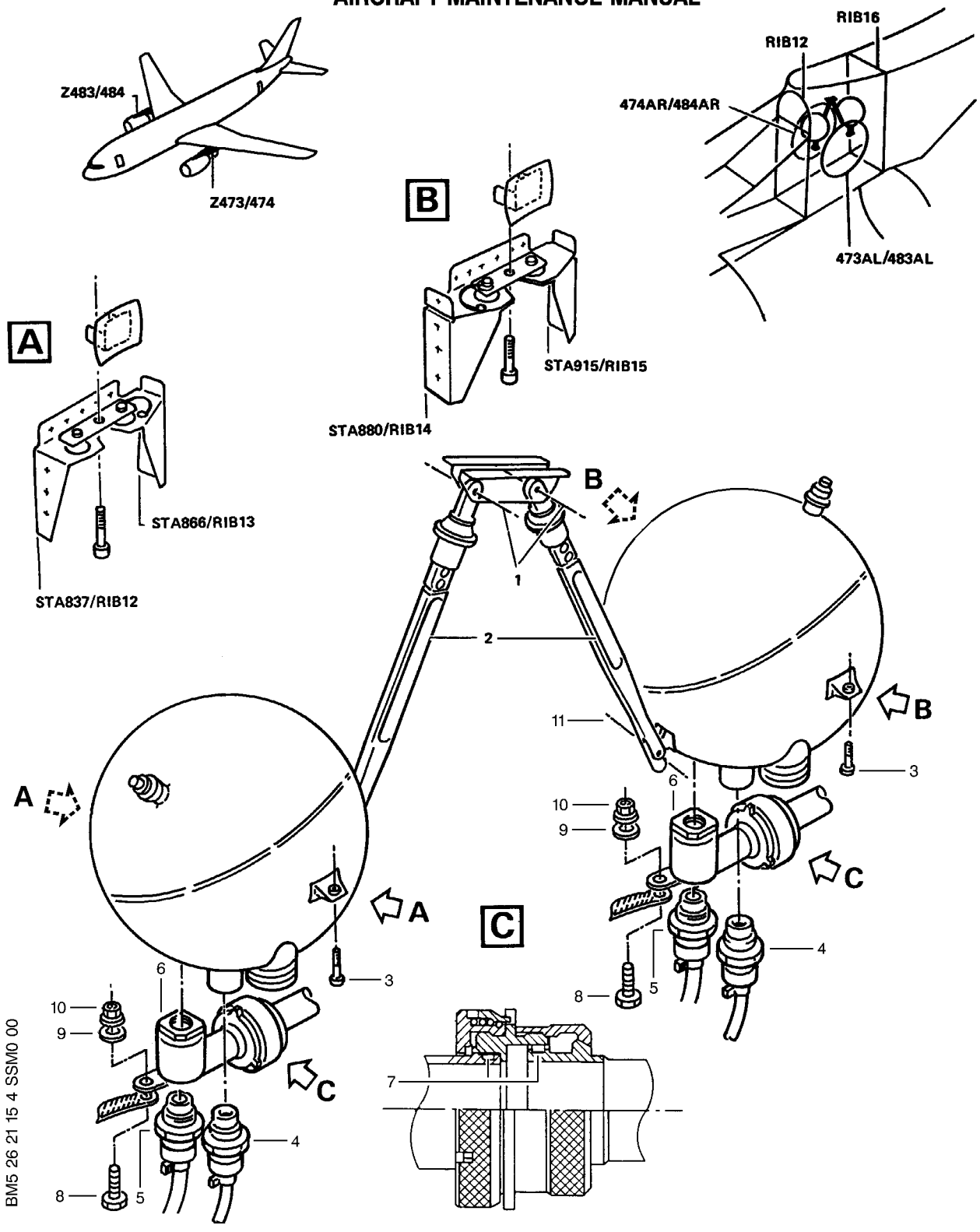
B. Removal
(Ref. Fig. 401)

R (1)Disconnect cartridge electrical supply connector (5) from discharge cartridge electrical connector installed on discharge head (6).
R WARNING : WHEN CARTRIDGE ELECTRICAL CONNECTORS ARE DISCONNECTED, CARTRIDGE ELECTRICAL PINS MUST BE SHUNTED WITH PROTECTIVE SHUNT, SHUNT PLUG OR SHORTING CLIP, TO PREVENT BOTTLE DISCHARGE WHICH COULD CAUSE INJURY TO MAINTENANCE PERSONNEL.
R (2)Install shunt, fire extinguisher cartridge shunt plug 325344 or protective cap (if supplied by bottle vendor) to discharge cartridge electrical connector installed on discharge head (6).
R (3)Untighten nut (10) and remove bolt (8) and washer (9) attaching bonding braid.
R (4)Remove discharge head (6) (Ref. 26-21-14, P. Block 401).
R (5)Disconnect pressure switch electrical connector (4).
R (6)Install blanking cap on pressure switch coupling end.
R (7)Install engine fire extinguisher removal/installation equipment 98A26201000000 on upper stiffener RIB13 or RIB15 according to bottle to be removed.
R (8)Slightly untighten bolt (1).
R (9)Remove bolt (8). Stow support arm (2).
R (10)Hold bottle manually.
R (11)Remove side attachment bolts (3).
R (12)Disengage and remove fire extinguisher bottle.
R (13)Remove and discard O-rings (7) from discharge head end.

C. Preparation of the Replacement Component
(1)Carry out a visual check and make certain that bottle does not show evidence of corrosion, impact or extensive scoring.
Check bottle-to-attachment lug welding for correct condition.
NOTE : If in doubt, carry out a dye-penetrant inspection of welding area.
(2)Check weight of new bottle :
NOTE : Weight check of new bottle is not requested if : NATIONAL REQUIREMENTS are fulfilled.
NOTE : The fire extinguisher bottle must be replaced if weight is outside the tolerances given on manufacturer's specification plate. Any decrease in weight results from a leak and consequently bottle sealing is no longer reliable.
(3)Check against expiry date indicated on the cartridge that it is still serviceable.

D. Installation
(1)Install new O-rings (7) on discharge head end.
(2)Inspect bottle attachment area. Check mounting brackets for cracks, distortions or traces of corrosion.

WARNING : AS MAIN FRAME IS MADE OF TITANIUM, IT IS FORBIDDEN TO USE TRICHLOROETHYLENE FOR CLEANING AS THIS COULD CAUSE SERIOUS DAMAGE TO ENGINE PYLON.




Engine Fire Extinguisher Bottle - Removal/Installation
Figure 401

(3)Check condition of bonding strips secured to bottle mounting brackets and providing bottle grounding.
(4)Check electrical connectors (4) and (5).
NOTE : Make sure that they are in correct condition.
(5)Make sure that engine fire extinguisher removal/installation equipment 98A26201000000 is installed.
(6)Position bottle into pylon and install bolts (3) without tightening.
(7)Install bolt (11) and support arm (2). Tighten bolts (1), (11), and (3).
(8)Remove all blanking caps.
(9)Install discharge head (6) (Ref. 26-21-14, P. Block 401).

R WARNING : BEFORE INSTALLING CARTRIDGE CONNECTOR PLUG, REMOVE PROTECTIVE
R SHUNT, SHUNT PLUG OR SHORTING CLIP FROM CARTRIDGE ELECTRICAL
R PINS.
R MAKE CERTAIN THAT THERE IS NO SHUNT BETWEEN PINS OF CARTRIDGE
R CONNECTOR PLUG.

R (10)Remove fire extinguisher cartridge shunt plug 325344 or protective cap (if supplied by bottle vendor) from discharge cartridge electrical connector installed on discharge head (6).
R (11)Connect electrical supply connector to cartridge (5) and pressure switch elecrical connector (4).
R (12)Attach bonding braid to eye end using bolt (8), washer (9) and nut (10).
R (13)Remove removal/installation tool from pylon as required.

E. Not Applicable

F. Test
(1)Job set-up
(a)Remove safety clips and tags and close circuit breakers 1WE, 3WE, 5WE and 7WE.

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS ARE ISOLATED.

(b)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(c)Make certain that electronics racks ventilation is correct (Ref. 21-21-00, P. Block 301).
(2)Squib test of the fire extinguisher bottles.
(a)In the flight compartment, overhead panel
1 Check that AGENT 1 and 2 legends and ENG FIRE handle warning lights of control modules 39WD and 40WD are off.

WARNING : BEFORE CARRYING OUT TEST, MAKE CERTAIN THAT FIRE HANDLES ARE NOT PULLED.

2 Press SQUIB TEST pushbutton switch and check that SQUIB legends of control modules 39WD and 40WD come on.
(3)Test of fire extinguisher bottle low pressure indicating circuits.
(a)On ENG1 (ENG2) FIRE handle control module 39WD (40WD)
- make certain that ENG1 (ENG2) FIRE handle is latched in pushed

position
- make certain that AGENT1 and AGENT2 pushbutton switches are released.

(b)Open, safety and tag circuit breakers 5WE and 7WE.
(c)Test

| ACTION | RESULT |
|---|---|
| 1 On fire extinguisher bottle 23WE (24WE), in Left (right) engine pylon | |
| - engage Allen wrench in socket provided for this purpose in pressure switch. Turn wrench until stop is reached (approx. 1/4 turn) | On ENG1 (ENG2) FIRE control module 39WD (40WD)<br>- DISCH legend of AGENT1 pushbutton switch comes on. |
| - turn Allen wrench back to initial position | On control module 39WD (40WD)<br>- DISCH legend of AGENT1 pushbutton switch goes off |
| 2 On bottle 25WE (26WE) in left (right) engine pylon | |
| - engage Allen wrench in socket provided for this purpose in pressure switch. Turn wrench until stop is reached (approx. 1/4 turn). | On control module 39WD (40WD)<br>- DISCH legend of AGENT2 pushbutton switch comes on |
| - turn Allen wrench back to initial position | On control module 39WD (40WD)<br>- DISCH legend of AGENT2 pushbutton switch goes off |

(4)Close-up
(a)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Restore system and aircraft to normal operating conditions.

G. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Clean working area if neccessary.
(3)Close access doors 473AL/474AR or 483AL/484AR.
(4)Remove access platforms from engine pylon.

## APU FIRE EXTINGUISHING - DESCRIPTION AND OPERATION

1. General

The APU fire extinguishing system is designed to discharge an extinguishing agent into the APU compartment, when fire and overheat detection system becomes activated. In flight, the extinguishing system is manually activated, and on the ground it is automatically activated.

2. Component Location

R **ON A/C 001-100,

(Ref. Fig. 001)

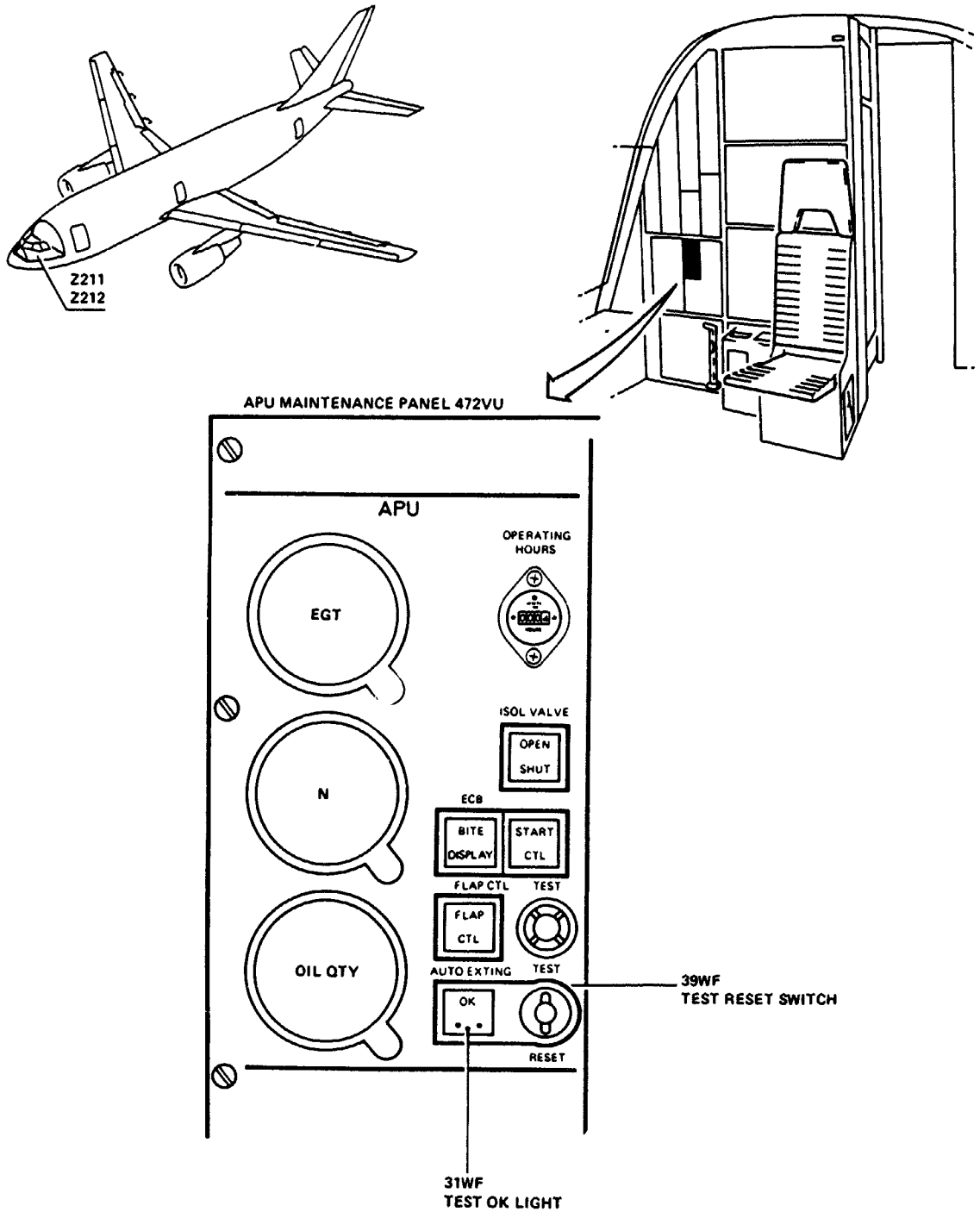
R **ON A/C 101-200,

(Ref. Fig. 002)

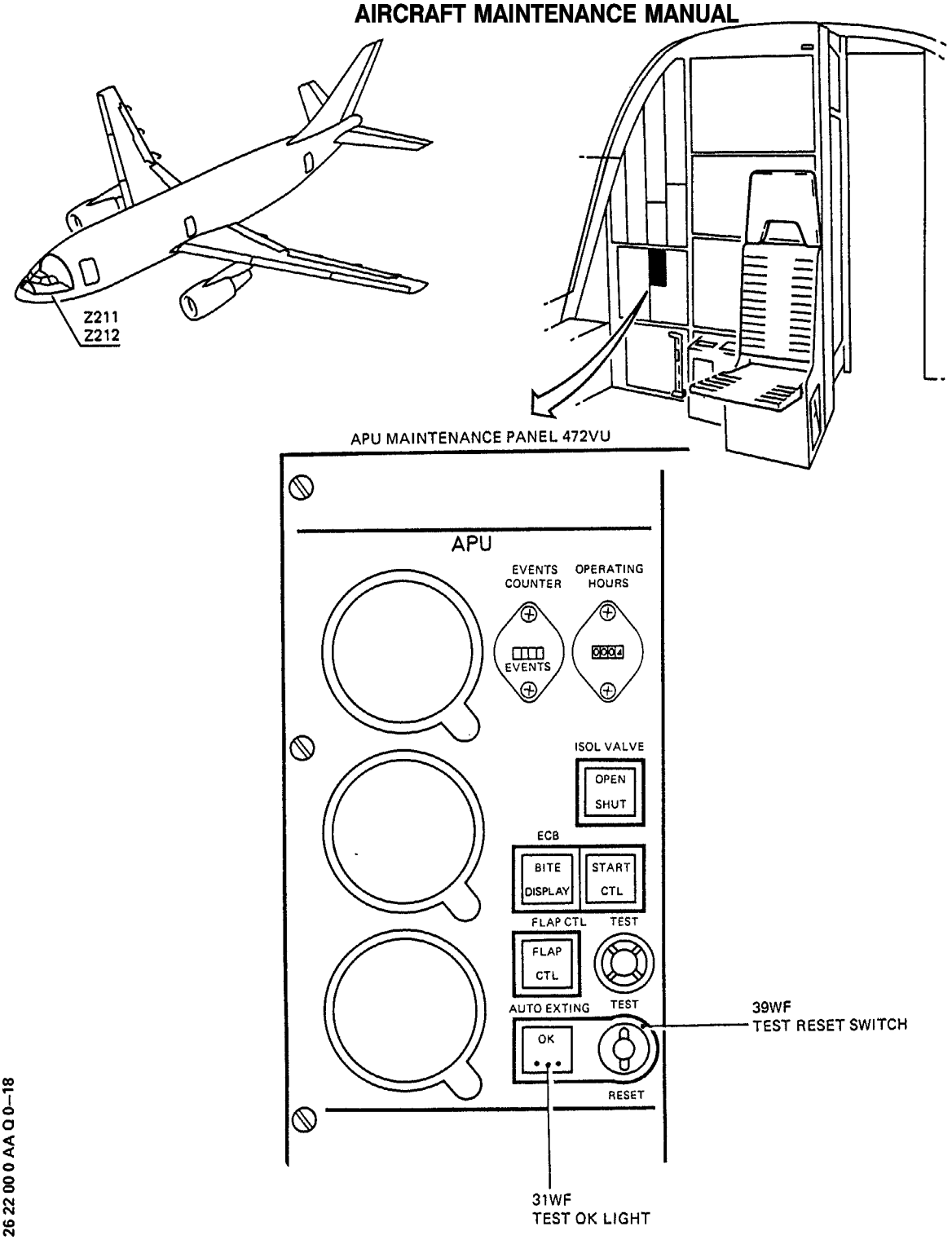
R **ON A/C ALL

(Ref. Fig. 003)
(Ref. Fig. 004)

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| 72GB | RELAY-RH GEAR SHOCK ABSORBER | 104VU | 121 | | |
| 89GB | RELAY-LH GEAR DOWNLOCKED | 104VU | 121 | | |
| 3WC | BOX-INTERPHONE | | 711 | | 23-42-12 |
| 4WC | HORN-EXTERNAL | | 120 | | 23-42-21 |
| 5WF | RELAY-LP VALVE | 282VU | 122 | 132AZ | |
| 6WF | RELAY-ISOL VALVE | 282VU | 122 | 132AZ | |
| 11WF | BOTTLE-FIRE EXTINGUISHER | | 313 | 313AL | 26-22-11 |
| 31WF | INDICATOR LIGHT-AUTO EXTING OK TEST | 472VU | 212 | | |
| 32WF | RELAY-AUTO TIME DELAY PULL | 282VU | 122 | | |
| 33WF | RELAY-AUTO TIME DELAY SQUIB | 282VU | 122 | 132AZ | |
| 34WF | RELAY-AUTO PULL | 282VU | 122 | 132AZ | |
| 35WF | RELAY-AUTO DISCH | 282VU | 122 | 132AZ | |
| 36WF | RELAY-EXTING GROUND TEST | 282VU | 122 | 132AZ | |
| 37WF | RELAY-EXTING GROUND TEST TIME DELAY | 282VU | 122 | 132AZ | |
| 38WF | RELAY-GROUND TEST | 282VU | 122 | 132AZ | |
| 39WF | SWITCH-TEST/RESET | 472VU | 212 | | |
| 40WF | RELAY-FIRE EMERG STOP | 282VU | 122 | 132AZ | |
| 41WF | RELAY-FIRE EMERG STOP | 282VU | 122 | 132AZ | |
| 42WF | DIODE | | | | |
| 44WF | RELAY-HORN OFF | 282VU | 122 | 132AZ | |
| 13WG | UNIT-FIRE DETECTION | 91VU | 121 | 132AZ | 26-13-11 |
| 20WG | APU FIRE CONTROL MODULE | 20VU | 210 | | 26-13-20 |
| 242LT | RELAY-DIMMING | 490VU | 212 | | |




Control and Indication
Figure 001

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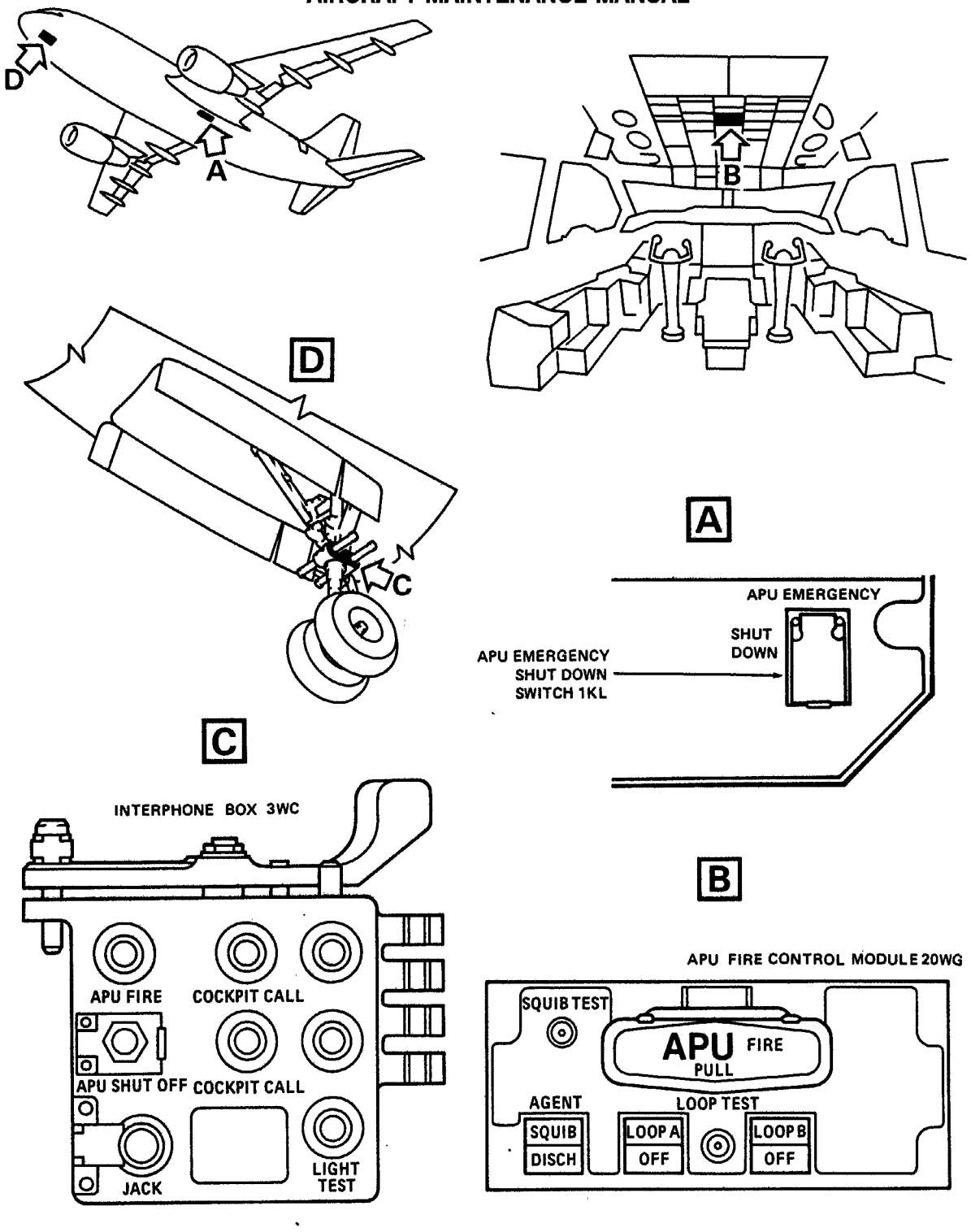
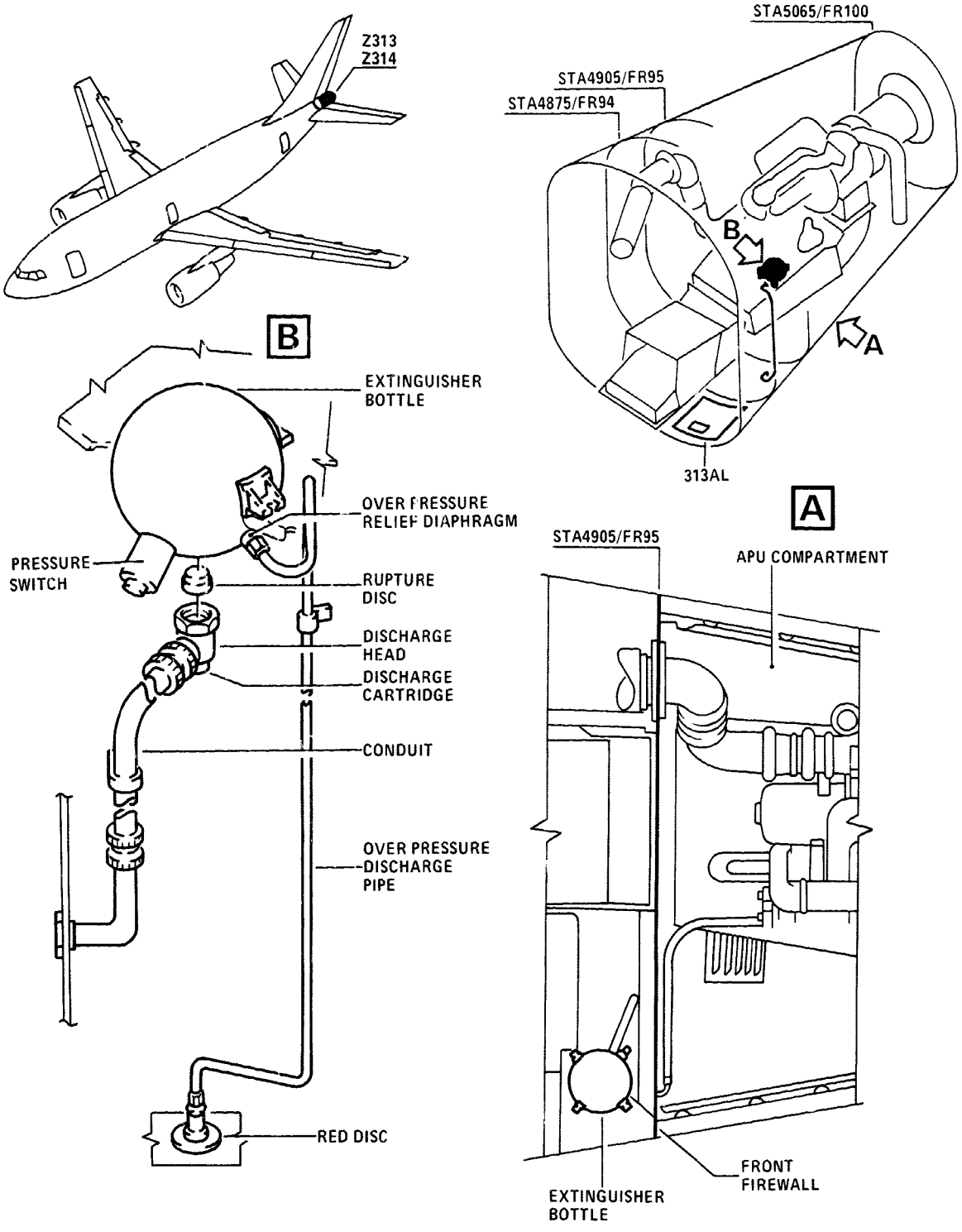
Control and Indication
Figure 002




BM 6 26 22 00 0 AC M 0-24

Control and Indication
Figure 003




Extinguishing Equipment
Figure 004

3. Description

A. The APU fire extinguishing system has a single fire extinguisher bottle located adjacent to the LH forward firewall of the APU compartment. The extinguisher bottle 11WF is fitted with a support bracket to the side fuselage structure. The bottle has a single discharge head with a cartridge installed and is connected to a rigid steel conduit which conveys the extinguishing agent, under nitrogen pressure, through the firewall into the APU compartment. Access to the bottle is gained through access panel 313AL.

4. Component Description

A. Extinguisher Bottle

** FOR HTL EXTINGUISHER BOTTLE P/N 33600005-1

(1)The HTL extinguisher bottle, fully charged with 5.0 +0.1 - 0.0 lb. (2.27 +0.05 - 0.0 kg) of halon and pressurized with 90 % nitrogen plus 10 % helium to 600 +25 - 0.0 psig (41.37 +1.7 - 0.0 bar) at 70 °F (21 °C), weighs 11.15 lb. (5.06 kg). The bottle is equipped with the following:

** FOR HTL EXTINGUISHER BOTTLE P/N 33600005-2

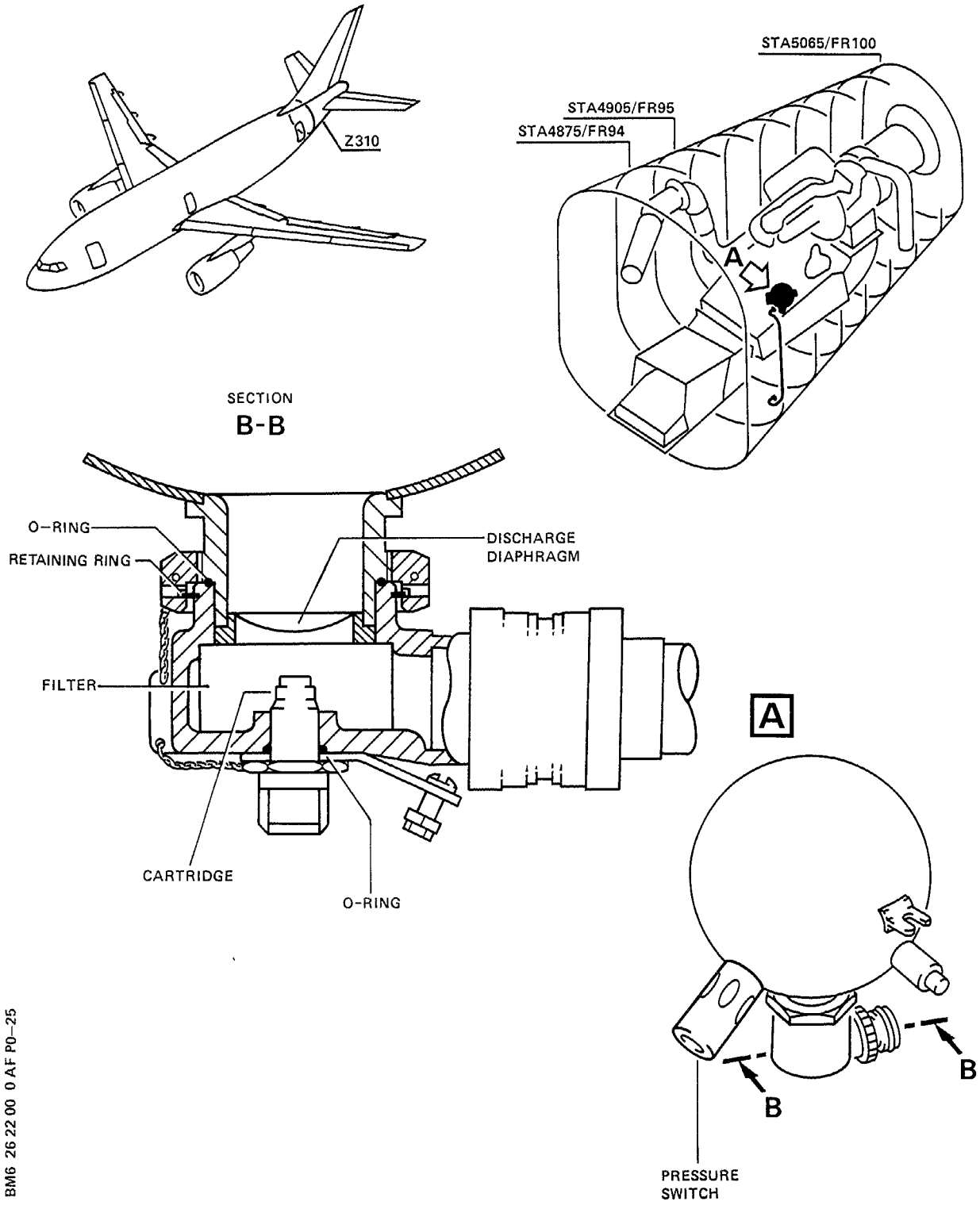
(1)The HTL extinguisher bottle, fully charged with 5.5 +0.1 - 0.0 lb. (2.47 +0.05 - 0.0 kg) of halon and pressurized with 90 % nitrogen plus 10 % helium to 600 +25 - 0.0 psig (41.37 +1.7 - 0.0 bar) at 70 °F (21 °C) weighs 11.65 lb. (5.28 kg). The bottle is equipped with the following:

** FOR ALL HTL EXTINGUISHER BOTTLES

(a)A pressure switch assembly. If the fire extinguishing bottle is discharged, the switch will activate the DISCH legend on APU fire control module 20WG.
(b)A discharge head supplying on demand the extinguishing agent through a conduit system to the APU compartment. The discharge head carries a discharge cartridge with one squib and covers a rupture disk. The squib contains two filaments.
(c)A fill port for refilling the bottle.

** AFTER HTL SB 35203375-26-1

(Ref. Fig. 005)
(2)An overpressure discharge pipe, connected to the fill port is routed from the extinguisher bottle to the skin of the aircraft, is sealed at its external orifice by a red disk. The red disk gives visual indication to the ground crew that the extinguishing agent has not vented to atmosphere due to overpressure.




Fire Extinguisher Bottle Discharge Head
Figure 005

B. Controls and Indicating

(1)On APU fire control module 20WG:

(a)APU-FIRE/PULL Handle

The APU-FIRE/PULL handle has two positions. An APU-FIRE warning light is integrated into the handle.

- In
  Normal position, mechanically locked.
- Pulled
  Pulling the handle electrically causes:
  . APU emergency shutdown (Ref. 49-62-00)
  . APU isolation valve closure
  . FUEL APU LP fire shutoff valve closure
  . Continuous repetetive chime (CRC) silencing and LOOP light goes off, SQUIB light comes on.
- APU FIRE
  The light comes on red independently of handle position as long as the fire warning is activated. APU FIRE goes off when the temperature detected by loops drops below warning threshold. Illumination of the APU FIRE light is accompanied by ECAM activation.

(b)AGENT Pushbutton Switch

The pushbutton switch controls the ignition of squibs and resultant discharge of fire extinguisher bottle. The pushbutton switch is activated only when the APU-FIRE/PULL handle is pulled.

- Momentarily pressed
  With APU-FIRE/PULL handle pulled, the squib is ignited for bottle discharge.
- Released
  The squib circuit is de-energized.
- SQUIB
  The light comes on white when the APU-FIRE/PULL handle is pulled to facilitate identification of the AGENT pushbutton switch to be activated. During SQUIB TEST, the light comes on to indicate a successful test.
- DISCH
  The light comes on amber, when the fire extinguisher bottle is depressurized after discharge.

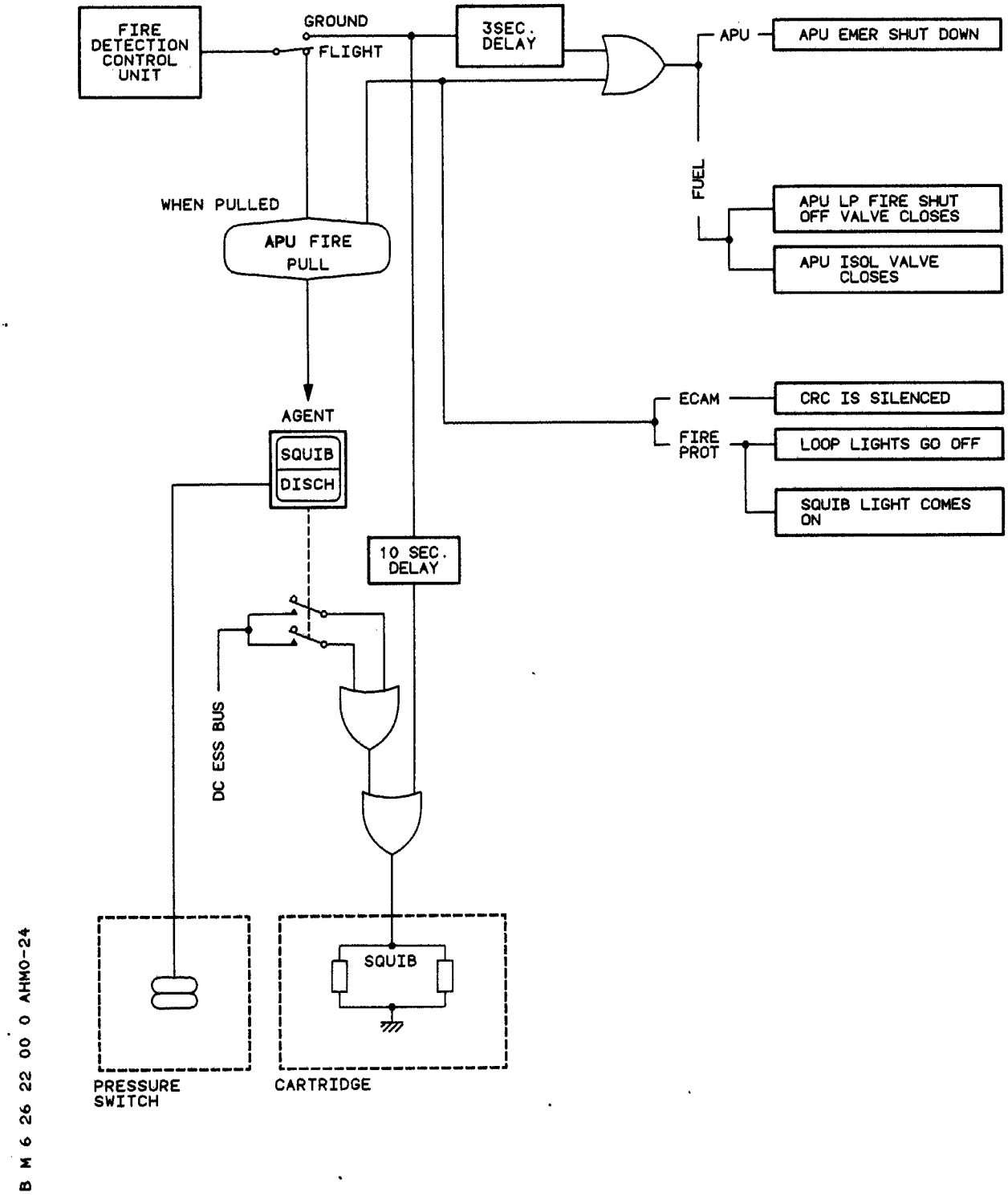
(c)SQUIB TEST Pushbutton Switch

The pushbutton switch controls the test of the filaments in the discharge head and their electrical circuit. When pressed with the APU-FIRE/PULL handle in normal position, the SQUIB light comes on, if filaments and circuit are operative.

(2)On APU maintenance panel 472VU:
(a)AUTO EXTING-TEST/RESET toggle switch 39WF
Test is to be performed on ground only.
- TEST
Toggle switch must be held during test. MASTER SW must be selected ON. APU FIRE warning, auto extinguishing and shutdown circuits are tested. Sequence duration is 10 seconds. The white OK light comes on to indicate a successful test.
NOTE : If in operation, the APU shuts down.
- RESET
Test circuit is reset.
- Neutral
Test circuit not energized.
(b)AUTO EXTING / OK Light 31WF
Comes on white, when auto extinguishing sequence is completed and test result is positive.
(3)On interphone box 3WC:
(a)APU FIRE Light
The APU FIRE light comes on red, accompanied by an external horn warning, when an APU fire is detected. The APU fire extinguisher will automatically discharge 10 seconds after the fire warning appearance.
The light will go off after extinction of the fire.
(b)APU SHUTOFF Pushbutton Switch
The pushbutton switch is guarded by a flap. When pressed in the event of an APU fire, the automatic shutdown is confirmed and the external horn warning is silenced.
(4)On refuel/defuel panel 110VU:
(a)APU EMERGENCY/SHUTDOWN Pushbutton Switch 1KL
The pushbutton is guarded by a flap. When pressed, in the event of an APU fire, shutdown is initiated or automatic shutdown is confirmed and the external horn warning is silenced.

5. Operation

A. Fire Extinguishing System in Flight
(Ref. Fig. 006)
(1)After an overheat or fire warning has been indicated, pulling the illuminated APU-FIRE/PULL control handle on APU fire control module 20WG will automatically shut down the APU, cancel the aural warning, show on indicators 6QF APU LP VALVE, 7QF ISOL VALVE that the SHUT legends come on and the associated valves have closed, and on AGENT pushbutton switch, SQUIB legend comes on.
(2)Pushing the AGENT pushbutton switch will complete the circuit and cause both filaments of the squib in the discharge cartridge of the extinguisher bottle to ignite and consequently detonate the cartridge.
NOTE : Only one filament is sufficient to enable operation of the discharge cartridge.
Detonation of the discharge cartridge ruptures the discharge diaphragm. The extinguishing agent will thus be directed into the APU compartment. Parts from the burst diaphragm are retained by the filter in the discharge head.

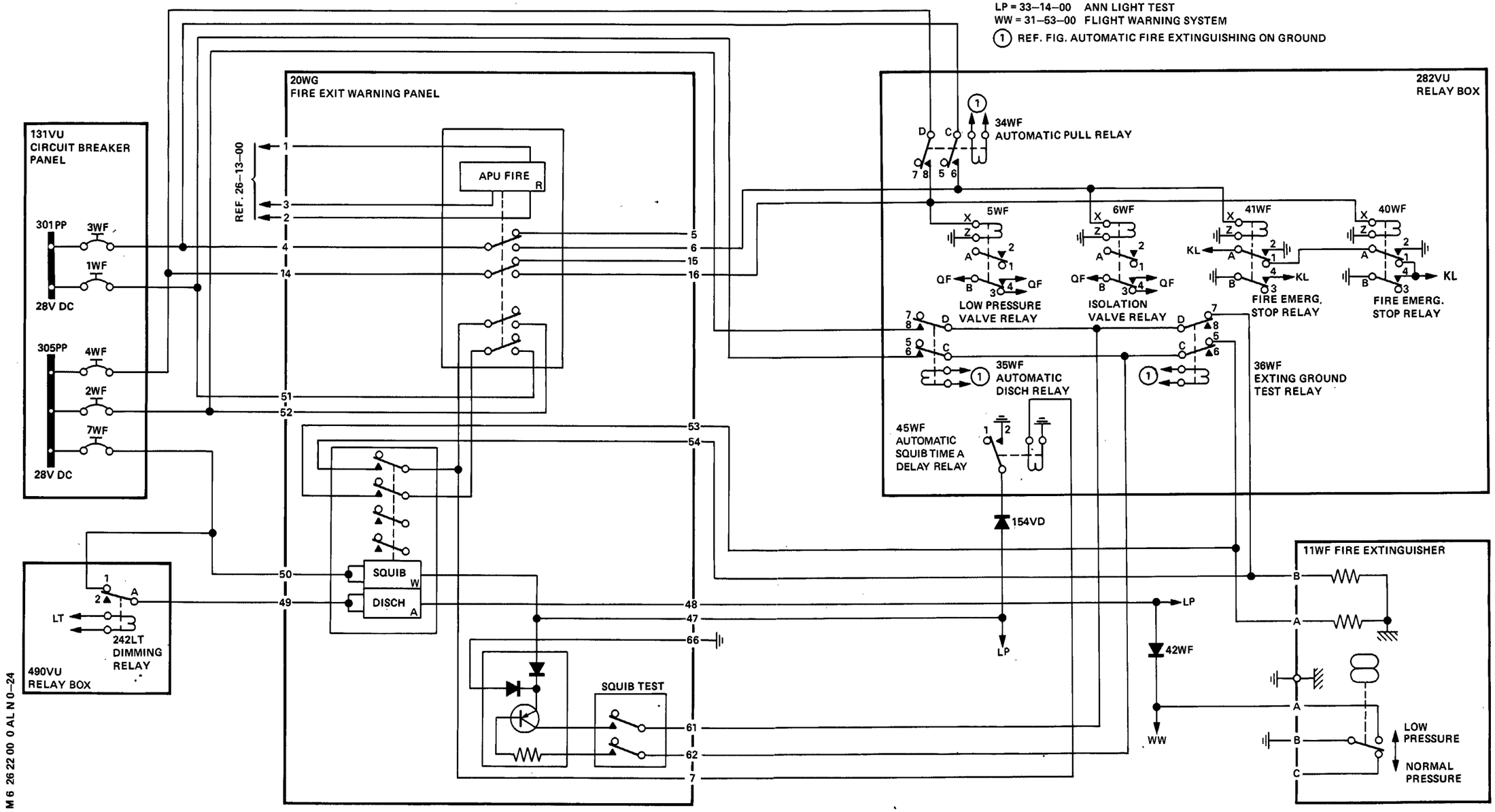



Fire Extinguishing System - Schematic
Figure 006

(3)The amber **DISCH** legend in **AGENT** pushbutton switch on **APU** fire control module 20WG comes on and the **SQUIB** legend goes off, when the fire extinguisher bottle is discharged.
(Ref. Fig. 007)

INTENTIONALLY BLANK

QF = 49–33–00 APU FUEL FIRE SHUT OFF CONTROL
KL = 49–62–00 APU EMERGENCY SHUTDOWN
LT = 33–16–00 ANN LIGHT DIMMING
LP = 33–14–00 ANN LIGHT TEST
WW = 31–53–00 FLIGHT WARNING SYSTEM
(1) REF. FIG. AUTOMATIC FIRE EXTINGUISHING ON GROUND




BM6 26 22 00 0 AL N 0–24

APU Fire Extinguishing System
Aircraft in Flight
Figure 007

B. Automatic Fire Extinguishing System on Ground (Ref. Fig. 006)
After an APU fire or overheat warning from the fire detection control unit 13WG has been initiated (Ref. 26-13-00), the APU fire extinguishing system is automatically activated.
Following actions occur:
- LOOP A (B) legend goes off.
- APU-FIRE/Pull handle light comes on red.
- On main instrument panels 3VU and 5VU:
  . MASTER/WARNING lights come on.

On L ECAM display unit following message appears:
- APU FIRE
  - FIRE HANDLE ..... PULL
  - AGENT AFT 10s ..... DISCH
  - MASTER SW ..... OFF

In flight compartment:
- Repetetive chime sounds.

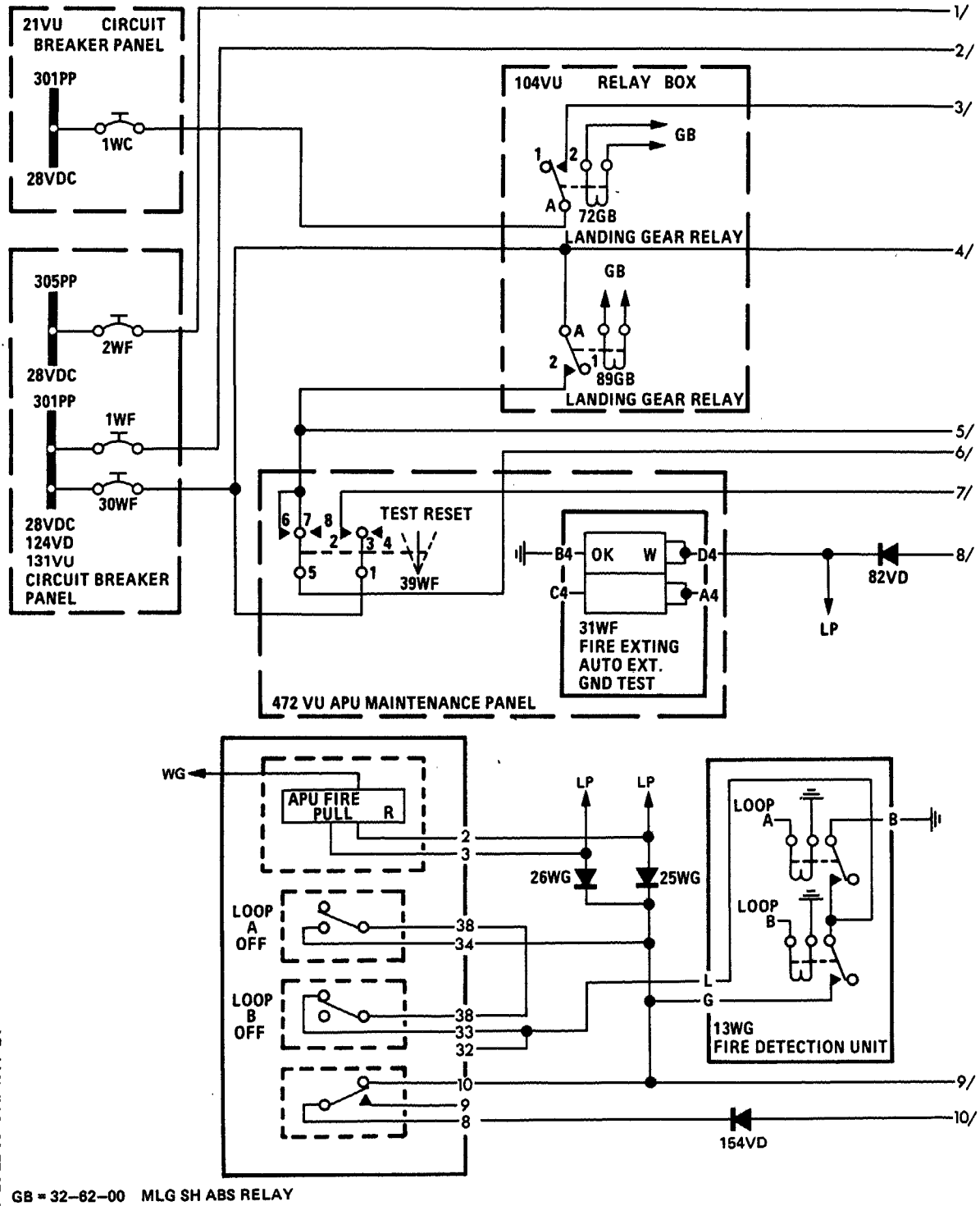
After 3 seconds delay:
- APU emergency shutdown is initiated (Ref. 49-62-00).
- APU isolation valve 11QF closes.
  . SHUT indicator light 7QF comes on.
- APU LP fire shutoff valve 12QF closes.
  . SHUT legend 6QF comes on.
- External horn in nose landing gear bay sounds.
- APU FIRE light on interphone box 3WC comes on.

After 10 seconds delay:
- Extinguishing is initiated.
- DISCH legend comes on amber, when fire extinguisher bottle is depressurized after discharge.

(Ref. Fig. 008)

C. Percussion/Extinguishing - Test Facilities
(1) Extinguisher Bottle SQUIB TEST Circuit - Aircraft in Flight or on Ground:
A SQUIB TEST pushbutton switch and a white SQUIB indication light on AGENT pushbutton switch in APU fire control module 20WG provide the circuit test facilities.
When SQUIB TEST pushbutton switch is pressed with APU-FIRE/PULL handle in normal position, the SQUIB indication light comes on, if squib and circuit are operative.

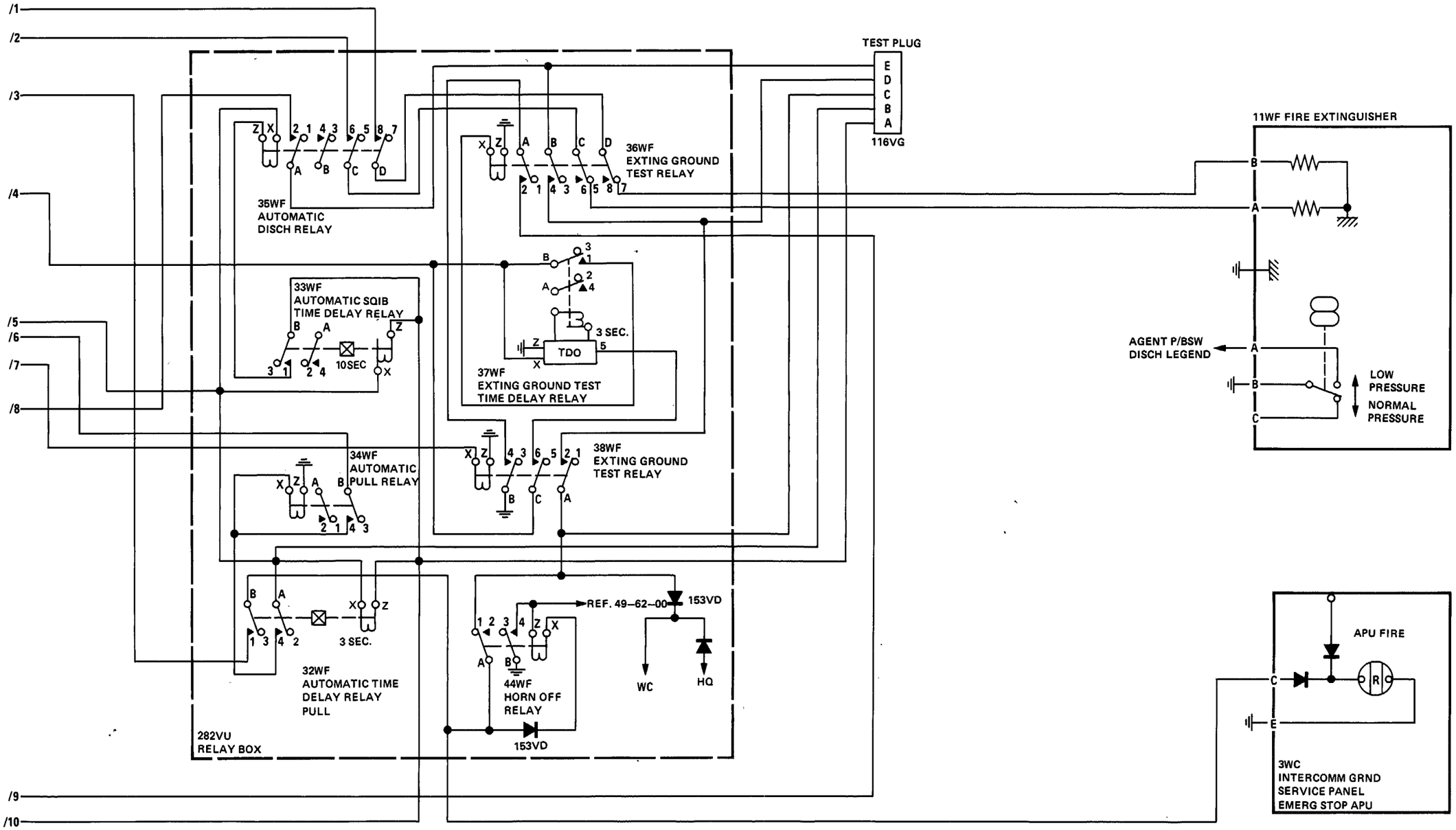
(2) Automatic Extinguishing System Test - Aircraft on Ground - APU not running. The toggle switch 39WF controls the test of the auto extinguishing system fire warning and automatic shutdown. When switched and held in TEST position, a simulated APU fire signal is generated and led through the auto extinguishing electrical circuit. When relays 32WF, 35WF, 36WF and 38WF are energized the OK indication light 31WF, located on APU maintenance panel 472VU, comes on. To prevent discharge of the fire extinguisher bottle, automatic discharge relay 35WF is energized with a delay of 10 seconds and automatic pull relay 34WF is energized with a delay of 3 seconds. External warnings are given by the APU FIRE light on interphone box 3WC and an external horn 4WC, located in NLG wheel well. After testing the system, set the switch 39WF to RESET position in order to release relay 34WF which is latched through its




B M 6 26 22 00 0 AP N A–24

GB = 32–62–00 MLG SH ABS RELAY
LP = 33–14–00 ANN LIGHT TEST
WG = 26–13–00 APU FIRE AND OVERHEAT DETECTION

Automatic Fire Extinguishing on Ground
(Sheet 1/2)
Figure 008




HQ = 21–21–00 ELECTRONICS RACKS AIR DISTRIBUTION
WC = 23–42–00 HORN

BM6 26 22 00 0APNM–24

Automatic Fire Extinguishing on Ground
(Sheet 2/2)
Figure 008

own contacts and de-energize relays 32WF, 35WF, 36WF and 38WF. The OK indicator light and the external warnings go off.
To prevent discharge of the fire extinguisher bottle at extinguishing ground test, relay 36WF is de-energized with a delay of 3 seconds, controlled by time delay relay 37WF.
Place switch 39WF to middle position.

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS ARE ISOLATED.
WARNING : DISCHARGE CARTRIDGES ARE CLASS 'C' EXPLOSIVES AND MUST ONLY BE HANDLED /STORED BY AUTHORIZED PERSONNEL AND DISPOSED OF BY AN APPROVED METHOD.

1. Functional Test of the Percussion/Electrical Circuit

A. Reason for the Job
(1)To check continuity of the electrical circuit appertaining to the APU fire extinguishing system by simulating a percussion operation. The squib test does not use the same circuit.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| (2) | Circuit Breaker Safety Clips and Tags |
| (3) | Voltmeter 28 V DC |
| (4) | Access Platform, 6 m (20 ft.) |
| (5) | Snapwire, 0.5 mm (0.020 in.) dia. |
| (6) | Corrosion-Resistant Steel Lockwire, 0.8 mm (0.032 in.) dia. |

Referenced Procedures

| | |
|---|---|
| - 23-44-00, P. Block 1 | Cabin and Service Interphone |
| - 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure
(1)Job Set-Up
(a)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | APU/FIRE EXTING/SQUIB/B | 2WF | A61 |
| 131VU | APU/FUEL/ISOL VALVE/SUPPLY | 1QF | B63 |
| 131VU | APU/START | 50KA | B54 |
| 131VU | APU/FIRE EXTING/SQUIB/A | 1WF | B61 |
| 131VU | APU/FUEL/LP VALVE/SUPPLY | 2QF | A63 |

(b)Position access platform.
(c)Open access door 313AL.
(d)On APU fire control module 20WG remove snapwire from APU-FIRE/PULL control handle.
(e)Cut and remove lockwire and disconnect electrical connector (11WF-B) from discharge cartridge on APU fire extinguisher bottle.
(f)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(g)Make certain that electronics racks ventilation is correct.
(h)Activate service interphone system (Ref. 23-44-00, P. Block 1).
(j)Remove safety clips and tags and close circuit breakers 1WF and 2WF.

(2)Test

NOTE : The following procedures require the services of two persons, one at zone 311, the other at APU fire control module 20WG and the use of interphone system.

| ACTION | RESULT |
|---|---|
| 1. On connector of APU fire extinguisher bottle 11WF-B:<br>- connect 28 V DC voltmeter between terminal A and ground, and then between terminal B and ground. | On connector of APU fire extinguisher bottle 11WF-B:<br>- Check zero reading between terminals A and ground and then B and ground. |
| 2. On APU fire control module 20WG:<br>- pull APU-FIRE/PULL control handle. | On APU fire control module 20WG:<br>- Indicator light SQUIB on AGENT pushbutton switch comes on.<br>On connector of APU fire extinguisher bottle 11WF-B:<br>- Check zero reading between terminal A and ground and then terminal B and ground. |
| 3. On APU fire control module 20WG:<br>- press and hold pushbutton switch AGENT. | On connector of APU fire extinguisher bottle 11WF-B:<br>- Check 28 V DC reading between terminal A and ground and then between terminal B and ground. |
| 4. On APU fire control module 20WG:<br>- release pushbutton switch AGENT. | On connector of APU fire extinguisher bottle 11WF-B:<br>- Check zero reading between terminal A and ground and then terminal B and ground. |
| 5. On APU fire control module 20WG:<br>- return APU-FIRE/PULL handle to stowed position. | On APU fire control module 20WG:<br>- Indicator light SQUIB on AGENT pushbutton switch goes off. |

(3)Close-Up
(a)Open, safety and tag circuit breakers 1WF, 2WF.
(b)Deactivate service interphone system (Ref. 23-44-00, P. Block 1).
(c)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).
(d)Connect electrical connector (11WF-B) to discharge cartridge on APU fire extinguisher bottle and safety with lockwire.
(e)On APU fire control module 20WG install snapwire to APU-FIRE/PULL control handle.
(f)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(g)Close access door 313AL.
(h)Remove access platform.
(j)Remove safety clip and tag and close circuit breaker 1WF, 2WF, 1QF, 2QF and 50KA.

2. Operational Test of Automatic Fire Extinguishing Circuit

A. Reason for the Job
(1)To check automatic fire extinguishing and associated systems are operational in the 'weight on wheels' mode.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure
(1)Job Set-Up
(a)Make certain that the following circuit breakers are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | CALLS/MECH | 1WC | J 8 |
| 21VU | ECAM/FLT WARN MONITOR | 4WW | B 6 |
| 21VU | ECAM/FLT WARN MONITOR | 24WW | B 7 |
| 131VU | APU/FUEL/LP VALVE/SUPPLY | 2QF | A63 |
| 131VU | APU/START | 50KA | B54 |
| 131VU | APU/FIRE DET/FIRE WARN | 3WG | B58 |
| 131VU | APU/FIRE/EXTING/ AUTO EXTING GND TEST | 30WF | B60 |
| 131VU | APU/FUEL/ISOL VALVE CTL | 3WF | B62 |
| 131VU | APU/FUEL/ISOL VALVE/SUPPLY | 1QF | B63 |

(b)Make certain that the following circuit breaker is open:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | APU/AIR INTAKE FLAP | 1KB | B55 |

(c)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(d)Make certain that electronics racks ventilation is correct.
(2)Test

| ACTION | RESULT |
|---|---|
| 1. On APU maintenance panel 472VU:<br>- place ANN LT switch in READ position. | On APU maintenance panel 472VU:<br>- ISOL VALVE position indicator 7QF white 'SHUT' light comes on. |
| 2. On APU panel 429VU:<br>- place MASTER SW switch 14KD in ON position. | On APU maintenance panel 472VU:<br>- ISOL VALVE position indicator 7QF white 'OPEN' light comes on, 'SHUT' light goes OFF. |
| 3. On APU maintenance panel 472VU:<br>- place toggle switch 39WF in TEST position (switch must be held for the duration of test sequence (10 sec.)). | On APU fire control module 20WG:<br>- APU-FIRE/PULL control handle light comes on red.<br>On interphone box panel 3WC:<br>- APU FIRE warning light comes on red. External horn in nose gear bay sounds.<br>On FUEL panel 430VU:<br>- APU LP VALVE flowbar 6QF is not visible and the associated position indicator light comes on amber 'SHUT'.<br>On APU maintenance panel 472VU:<br>- ISOL VALVE position indicator 7QF white 'SHUT' light comes on, 'OPEN' light goes off.<br>On main instrument panels 3VU and 5VU:<br>- MASTER/WARNING lights flash.<br>On APU maintenance panel 472VU:<br>- AUTO EXTING/'OK' light 31WF comes on white (10 seconds after test sequence is completed). |

| ACTION | RESULT |
|---|---|
| 4. On APU maintenance panel 472VU:<br>- place toggle switch 39WF in RESET position and hold. | External horn goes off.<br>On APU fire control module 20WG:<br>- APU-FIRE/PULL control handle light goes off.<br>On interphone box panel 3WC:<br>- APU FIRE warning light goes off.<br>On FUEL panel 430VU:<br>- APU LP VALVE flowbar 6QF shows in-line and SHUT light goes off.<br>On APU maintenance panel 472VU:<br>- ISOL VALVE position indicator 7QF white 'OPEN' light comes on, 'SHUT' light goes off.<br>- AUTO EXTING/'OK' light 31WF goes off.<br>On main instrument panels 3VU and 5VU:<br>- MASTER/WARNING lights go off. |
| 5. On APU maintenance panel 472VU:<br>- release toggle switch 39WF. | Test circuit is de-energized. |
| 6. On APU panel 429VU:<br>- place MASTER SW switch 14KD in OFF position. | On APU maintenance panel 472VU:<br>- ISOL VALVE position indicator 7QF white 'SHUT' light comes on, 'OPEN' light goes off. |
| 7. On APU maintenance panel 472VU:<br>- place ANN LT switch in OFF position. | - ISOL VALVE position indicator 7QF 'SHUT' light goes off. |

(3)Close-Up
(a)Close circuit breaker 1KB.
(b)De-energize aircraft electrical network and disconnect ground power unit (Ref. 24-41-00, P. Block 301).

3. Operational Test of APU Fuel Feed Shut-Off Signal (When pulling APU FIRE/PULL Handle)

A. Carry out following tests:
(1)Operational test of fuel low pressure valve (Ref. 49-31-00, P. Block 501).
(2)Operational test of fuel isolation valve (Ref. 49-31-00, P. Block 501).

4. Operational Squib Test of APU Fire Extinguishing Circuit

A. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |

Referenced Procedure
- 24-41-00, P. Block 301 — AC External Power Control

B. Procedure

(1)Job Set-Up

(a)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Make certain that electronics racks ventilation is correct.

(c)Make certain that the following circuit breaker is closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | APU FIRE EXTING/SQUIB TEST | 7WF | A60 |

(2)Test

| ACTION | RESULT |
|---|---|
| 1. On APU fire control module 20WG:<br>- press and hold pushbutton switch SQUIB TEST. | On APU fire control module 20WG:<br>- indicator light SQUIB comes on. |
| 2. On APU fire control module 20WG:<br>- release pushbutton switch SQUIB TEST. | On APU fire control module 20WG:<br>- indicator light SQUIB goes off. |

(3)Close-Up

(a)De-energize aircraft electrical network and disconnect electrical ground power (Ref. 24-41-00, P. Block 301).

5. Functional Test of Extinguisher Bottle (HTL) Pressure Drop Indicating - Circuit

A. Reason for the Job

(1)To check the correct operation of indicator light DISCH during simulated pressure drop on the APU fire extinguisher bottle.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| (2) | Access Platform, 6 m (20 ft.) |
| (3) | Allen Key, 3/32 in. |

Referenced Procedures

| | |
|---|---|
| - 23-44-00, P. Block 1 | Cabin and Service Interphone |
| - 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure

(1)Job Set-Up

(a)Position access platform.

(b)Open access door 313AL.

(c)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).

(d)Make certain that electronics racks ventilation is correct.

(e)Activate service interphone system (Ref. 23-44-00, P. Block 1).

(f)Make certain that the following circuit breaker is closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | APU/FIRE EXTING/SQUIB TEST | 7WF | A60 |

(2)Test

NOTE : The following procedures require the services of two persons, one at zone 311, the other at APU fire control module 20WG and the use of the interphone system.

| ACTION | RESULT |
|---|---|
| 1. Insert allen key in hexagon test socket located on pressure switch on fire extinguisher bottle. Slowly turn allen key approximately ten degrees in any direction. | On APU fire control module 20WG:<br>- DISCH indicator light comes on. |
| 2. Slowly let allen key return to initial position and remove. | On APU fire control module 20WG:<br>- DISCH indicator light goes off. |

NOTE : The allen key must come back by itself to the initial position under the pressure in the fire extinguisher bottle.

3. Close-Up
(a)Deactivate service interphone system (Ref. 23-44-00, P. Block 1).
(b)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(c)Close access door 313AL.
(d)De-energize aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).
(e)Remove access platform.

6. Functional Test of APU Automatic Fire Extinguishing Circuit

A. Reason for the Job
(1)To check that APU automatic fire extinguishing circuit operates correctly.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| (2)860135970100000 | Test-Set - APU Fire Extinguishing System |

Referenced Procedures

| | |
|---|---|
| - 23-44-00, P. Block 1 | Cabin and Service Interphone |
| - 24-41-00, P. Block 301 | AC External Power Control |

C. Procedure
(1)Job Set-Up
(a)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)Make certain that electronics racks ventilation is correct.
(c)Activate service interphone system (Ref. 23-44-00, P. Block 1).
(d)Make certain that the following circuit breakers are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 21VU | CALLS/MECH | 1WC | J 8 |
| 131VU | APU/FIRE EXTING/AUTO EXTING GND TEST | 30WF | B60 |
| 131VU | APU/FIRE DET/FIRE WARN | 3WG | B58 |

R **ON A/C 001-104,

(2)Test
NOTE : The following procedures require the services of two persons, one at zone 122, the other at APU fire control module 20WG and the use of service interphone system.

| ACTION | RESULT |
|---|---|

| ACTION | RESULT |
|---|---|
| 1. In avionics compartment, on Relay Box panel 282VU:<br>- connect test-set to test connection and ground.<br>NOTE : Light P3 comes on until test set is connected to ground. | On test-set:<br>- light P2.POWER comes on. |
| 2. On APU maintenance panel 472VU:<br>- place and hold toggle switch 39WF in TEST position. | On APU fire control module 20WG:<br>- APU-FIRE/PULL control handle warning light comes on red.<br>On test-set:<br>- light P1 GROUND comes on.<br>In flight compartment, after 3 seconds delay:<br>- repetitive chime sounds.<br>- external horn in nose gear bay sounds.<br>On test-set:<br>- lights P3, P4 and P5 come on.<br>On interphone box panel 3WC:<br>- APU FIRE warning light comes on.<br>On APU maintenance panel 472VU, after 10 seconds delay:<br>- AUTO EXTING/'OK' light 31WF comes on white. |
| 3. On APU fire control module 20WG:<br>- Press and hold LOOP TEST pushbutton switch. | - external horn sound stops.<br>On APU maintenance panel 472VU:<br>- AUTO EXTING/'OK' light 31WF goes off.<br>On interphone box panel 3WC:<br>- APU FIRE warning light goes off.<br>On test-set:<br>- lights P3, P4 and P5 go off. |
| 4. On APU fire control module 20WG:<br>- release LOOP TEST pushbutton switch. | After 3 seconds delay:<br>- external horn in nose gear bay sounds.<br>On interphone box panel 3WC:<br>- APU FIRE warning light comes on.<br>On test-set:<br>- lights P3, P4 and P5 come on.<br>On APU maintenance panel 472VU, after 10 seconds delay:<br>- AUTO EXTING/'OK' light 31WF comes on white. |

| ACTION | RESULT |
|---|---|
| 5. On interphone box panel 3WC:<br>- push and release APU SHUT OFF pushbutton switch. | - external horn sound stops.<br>On APU maintenance panel 472VU:<br>- AUTO EXTING/'OK' light 31WF goes off.<br>On test-set:<br>- lights P3, P4 and P5 go off. |
| 6. On APU maintenance panel 472VU:<br>- place toggle switch 39WF in RESET position and release toggle switch. | On APU fire control module 20WG:<br>- APU-FIRE/PULL control handle warning light goes off.<br>In flight compartment:<br>- repetitive chime stops.<br>On test-set:<br>- light P1 GROUND goes off. |
| 7. On Relay Box panel 282VU:<br>- disconnect and remove test-set. | On test-set:<br>- light P2 POWER goes off. |

(3)Close-Up
(a)De-energize aircraft electrical network and disconnect ground power unit (Ref. 24-41-00, P. Block 301).
(b)Deactivate service interphone system (Ref. 23-44-00, P. Block 1).

R **ON A/C 105-200,

R (2)Test
R NOTE : The following procedures require the services of two persons, one
R at zone 122, the other at APU fire control module 20WG and the
R use of service interphone system.

| R ACTION | RESULT |
|---|---|
| R 1. In avionics compartment, on Relay Box panel 282VU:<br>R - connect test-set to test connection and ground.<br>R NOTE : Light P3 comes on until test set is connected to ground. | On test-set:<br>- light P2.POWER comes on. |
| R 2. On APU maintenance panel 472VU:<br>R - place and hold toggle switch 39WF in TEST position.<br>R | On APU fire control module 20WG:<br>- APU-FIRE/PULL control handle warning light comes on red.<br>On test-set:<br>- light P1 GROUND comes on. |

| ACTION | RESULT |
|---|---|
| | In flight compartment,<br>after 4.5 seconds delay:<br>- repetitive chime sounds.<br>- external horn in nose gear bay sounds.<br>On test-set:<br>- lights P3, P4 and P5 come on.<br>On interphone box panel 3WC:<br>- APU FIRE warning light comes on.<br>On APU maintenance panel 472VU,<br>after 10 seconds delay:<br>- AUTO EXTING/'OK' light 31WF comes on white. |
| 3. On APU fire control module 20WG:<br>- Press and hold LOOP TEST pushbutton switch. | - external horn sound stops.<br>On APU maintenance panel 472VU:<br>- AUTO EXTING/'OK' light 31WF goes off.<br>On interphone box panel 3WC:<br>- APU FIRE warning light goes off.<br>On test-set:<br>- lights P3, P4 and P5 go off. |
| 4. On APU fire control module 20WG:<br>- release LOOP TEST pushbutton switch. | After 4.5 seconds delay:<br>- external horn in nose gear bay sounds.<br>On interphone box panel 3WC:<br>- APU FIRE warning light comes on.<br>On test-set:<br>- lights P3, P4 and P5 come on.<br>On APU maintenance panel 472VU,<br>after 10 seconds delay:<br>- AUTO EXTING/'OK' light 31WF comes on white. |
| 5. On interphone box panel 3WC:<br>- push and release APU SHUT OFF pushbutton switch. | - external horn sound stops.<br>On APU maintenance panel 472VU:<br>- AUTO EXTING/'OK' light 31WF goes off.<br>On test-set:<br>- lights P3, P4 and P5 go off. |
| 6. On APU maintenance panel 472VU:<br>- place toggle switch 39WF in RESET position and release toggle switch. | On APU fire control module 20WG:<br>- APU-FIRE/PULL control handle warning light goes off.<br>In flight compartment:<br>- repetitive chime stops. |

| ACTION | RESULT |
|---|---|
| | On test-set:<br>- light P1 GROUND goes off. |
| 7. On Relay Box panel 282VU:<br>- disconnect and remove test-set. | On test-set:<br>- light P2 POWER goes off. |

(3)Close-Up
(a)De-energize aircraft electrical network and disconnect ground power unit (Ref. 24-41-00, P. Block 301).
(b)Deactivate service interphone system (Ref. 23-44-00, P. Block 1).

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7. Hydrostatic Test of the APU Fire Extinguisher Bottle

A. Reason for the Job

R (1)Remove APU fire extinguisher bottle.
R (2)Hydrostatic test of bottle.
R (3)Reinstall bottle.
R (4)To avoid unwanted loss of pressure.

B. Referenced Procedures

- 26-22-11, P. Block 401 Fire Extinguisher Bottle D
- 52-10-00, P. Block 301 Passenger/Crew Doors - Special Precautions D

C. Procedure

(1)Job Set Up
(a)Open passenger/crew door and safety emergency escape slide, door damper and emergency operation cylinder and door warning system (Ref. AMM 52-10-00, P. Block 301).

(2)Hydrostatic Test of Fire Extinguisher Bottle
(a)Remove the APU Fire-Extinguisher Bottle (Ref. AMM 26-22-11, P. Block 401).
(b)Do a hydrostatic test of the APU Fire Extinguisher Bottle
- For the P/N 472412-1, refer to CMM 262076.
- For the P/N 33600005-1, refer to CMM 262005.
(c)Reinstall serviceable APU Fire-Extinguisher Bottle (Ref. AMM 26-22-11, P. Block 401).

(3)Close Up
(a)Arm door damper and emergency operation cylinder and activate door warning system (Ref. AMM 52-10-00, P. Block 301).
(b)Close passenger/crew door.

## APU FIRE EXTINGUISHING DISCHARGE LINE INSPECTION/CHECK

1. Reason for Job

A. To ensure that APU fire extinguishing discharge line is serviceable

R B. Detailed visual inspection of distribution piping.

2. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 6 m (20 ft.) |

3. Procedure

A. Job Set-Up
(1)Position access platform.
(2)Open access door 313AL.
(3)Open access doors 315AL and 316AL.

B. Inspection
(1)Carry out visual inspection of APU fire extinguishing discharge line.
(a)Check discharge lines for damage.
NOTE : Cracks or dents are not permissible.
(b)Inside APU compartment, check flange and attachment screws for damage.
NOTE : Cracks are not permissible.
(c)Check discharge line outlet for obstruction.

C. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Close access door 313AL.
(3)Close access doors 315AL and 316AL.
(4)Remove access platform.

APU FIRE EXTINGUISHING - DEACTIVATION/REACTIVATION

Ref.: MMEL Sect. 1.26, Item 7 (AGENT 'DISCH' lt.)

R Ref.: MMEL Sect. 1.26, Item 16-B (APU SQUIB TEST)

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS ARE ISOLATED.

WARNING : DISCHARGE CARTRIDGES ARE CLASS 'C' EXPLOSIVES AND MUST ONLY BE HANDLED/STORED BY AUTHORIZED PERSONNEL OR DISPOSED OF BY AN APPROVED METHOD.

WARNING : PROTECTIVE CAPS MUST BE INSTALLED DURING REMOVAL/INSTALLATION OF BOTTLE, TO PREVENT RUPTURE OF DISCHARGE DIAPHRAGM.

1. Weight Check of Fire Extinguisher Bottle

A. Reason for Job

(1)MMEL Sect. 1.26, Item 7 APU AGENT ''DISCH'' lt. is inoperative.

(a)Weight check

(b)Note display in flight compartment.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| (2) | Access Platform, 6 m (20 ft.) |
| (3) | Blanking Caps |
| (4) | Corrosion-Resistant Steel Lockwire, 0.5 mm (0.02 in.) dia. |
| (5) | Corrosion-Resistant Steel Lockwire, 0.8 mm (0.032 in.) dia. |
| (6) | O-Rings |
| (7) | Torque Wrench, up to 75 lbf.ft. (10 m.daN) |
| (8) | Allen Key, 3/32 in. |

Referenced Procedures

| | |
|---|---|
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 26-22-12, P. Block 401 | Discharge Cartridge |

C. Procedure

(Ref. Fig. 901)

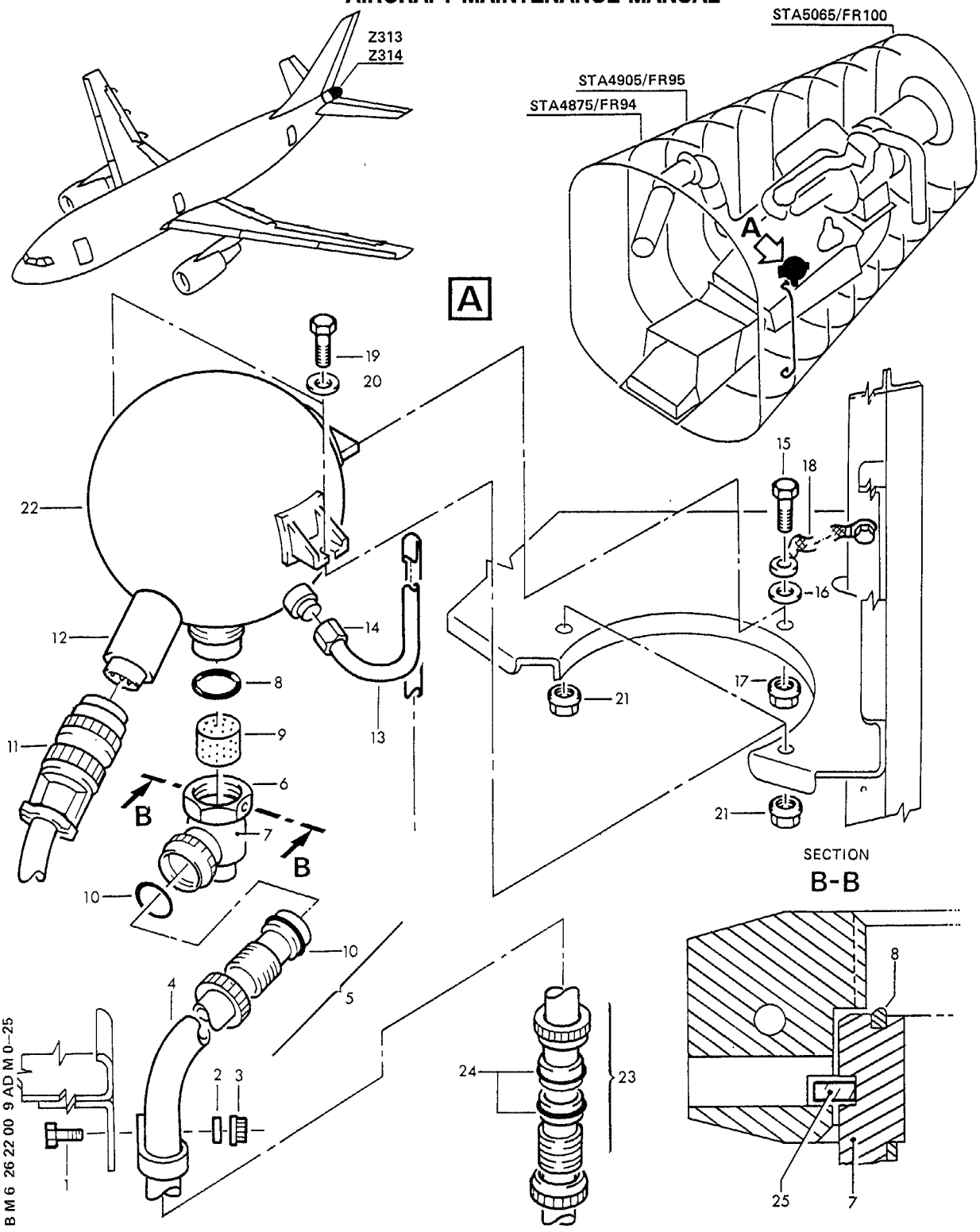
(1)Job Set-Up

(a)Position access platform.

(b)Open access door 313AL.

(c)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | APU/FIRE EXTING/SQUIB TEST | 7WF | A60 |
| 131VU | APU/FIRE EXTING/SQUIB B | 2WF | A61 |
| 131VU | APU/FIRE EXTING/SQUIB A | 1WF | B61 |




Fire Extinguisher Bottle
Figure 901

(2)Removal
  (a)Discharge Head
    1 Remove discharge cartridge (Ref. 26-22-12, P. Block 401).
    2 Remove bolt (1), washer (2) and nut (3).
    3 Cut and remove lockwire and disconnect union (5).
    4 Cut and remove lockwire from nut (6).
    5 Release nut (6) and remove discharge head (7), O-ring (8) and fit protective cap to extinguisher outlet boss. Discard O-ring (8).
    6 Remove O-rings (10).
  (b)Fire Extinguisher Bottle
    1 Cut and remove lockwire, disconnect electrical connector (11) and fit blanking caps.
    2 Release fitting (14), separate overpressure discharge line (13) from extinguisher bottle (22) and fit blanking caps.
    3 Remove bolt (15), washer (16), nut (17) and bonding jumper (18).
    4 Remove bolts (19), washers (20) and nuts (21).
    5 Remove fire extinguisher bottle (22) and fit blanking caps.

(3)Weight Check.
  (a)Weigh fire extinguisher bottle.
    NOTE : Check that gross weight of extinguisher bottle is within ±0.11 lb. (±0.05 kg) of the weight recorded on manufacturer's name plate.
    NOTE : Weight check of new bottle is not necessary if NATIONAL tolerance.
(4)Preparation of Replacement Components
  (a)Check discharge head for serviceability.
    NOTE : Check retaining ring (25) via inspection holes for integrity and correct position in discharge head (7).
  (b)Remove blanking caps from discharge outlets on replacement bottle.
  (c)Check O-rings (10) for serviceability and install onto union (5).
    NOTE : If replacement of O-rings (10) is necessary, O-rings (24) on union (23) must also be replaced.
  (d)Check filter (9) for serviceability and position in discharge head.
    NOTE : Do not remove filter from discharge head until replacement is necessary.
(5)Installation
  (a)Fire Extinguisher Bottle
    1 Position fire extinguisher bottle (22).
    2 Install bolts (19), washers (20) and nuts (21). Do not tighten at this stage.
    3 Install bolt (15), bonding jumper (18), washer (16) and nut (17). Do not tighten at this stage.
  (b)Discharge Head
    1 Install O-ring (8). Make certain O-ring is properly seated in groove.
    2 Remove protective cap from extinguisher outlet boss and install discharge head (7). Do not tighten nut (6) at this stage.

(c)Electrical and Distribution Connectors
1 Connect overpressure discharge line (13). Do not tighten fitting (14) at this stage.
2 Connect discharge line (4). Do not tighten union (5) at this stage.
3 Connect union (23), if required, and safety with lockwire 0.8 mm (0.032 in.) dia.
4 Install bolt (1), washer (2) and nut (3).
5 Tighten nuts (17, 21) at bottle mounting lugs.
6 Tighten fitting (14).
7 Tighten union (5) and safety with lockwire 0.8 mm (0.032 in.) dia.
8 Tighten discharge head nut (6) and TORQUE to between 40 and 50 lbf.ft. (5.4 and 6.8 m.daN). Safety with lockwire 0.8 mm (0.032 in.) dia.
9 Remove blanking caps, connect electrical connector (11) and safety with lockwire 0.5 mm (0.02 in.) dia.
10 Install discharge cartridge and connect electrical connector (Ref. 26-22-12, P. Block 401).

(6)Test
(a)Remove safety clips and tags and close circuit breakers 1WF, 2WF and 7WF.
(b)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(c)Make certain that electronics racks ventilation is correct.
(d)Carry out SQUIB TEST as follows:

| ACTION | RESULT |
|---|---|
| 1. On APU fire control module 20WG:<br>- Press and hold pushbutton switch SQUIB TEST. | On APU fire control module 20WG:<br>- Indicator light SQUIB comes on. |
| 2. On APU fire control module 20WG:<br>- Release pushbutton switch SQUIB TEST. | On APU fire control module 20WG:<br>- Indicator light SQUIB goes off. |

(7)Close-Up
(a)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(b)Close access door 313AL.
(c)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).
(d)Remove access platform.

2. Functional Test of the Percussion/Electrical Circuit

A. Reason for the Job

R Ref.: MEL Sect. 1.26, Item 16-B APU 'SQUIB' TEST, one test may be inoperative provided it is determined that the failure is in the test circuit only.

(1)To check continuity of the electrical circuit appertaining to the APU fire extinguishing system by simulating a percussion operation. The squib test does not use the same circuit.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| (1) | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| (2) | Circuit Breaker Safety Clips |
| (3) | Voltmeter 28V DC |
| (4) | Access Platform, 6 m (20 ft.) |
| (5) | Snapwire, 0.5 mm (0.020 in.) dia. |
| (6) | Corrosion-Resistant Steel Lockwire, 0.8 mm (0.032 in.) dia. |

Referenced Procedures

| | |
|---|---|
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 23-44-00, P. Block 1 | Cabin and Service Interphone |

C. Procedure

(1)Job Set-Up

(a)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | APU/FIRE EXTING/SQUIB B | 2WF | A61 |
| 131VU | APU/FUEL/ISOL VALVE | 1QF | A63 |
| 131VU | APU/START | 50KA | B54 |
| 131VU | APU/FIRE EXTING/SQUIB A | 1WF | B61 |
| 131VU | APU/FUEL/LP VALVE | 2QF | B63 |

(b)Position access platform.

(c)Open access door 313AL.

(d)On APU fire control module 20WG remove snapwire from APU-FIRE/PULL control handle.

(e)Cut and remove lockwire and disconnect electrical connector (11WF-B) from discharge cartridge on APU fire extinguisher bottle.

(f)Cap cartridge electrical connector.

(g)Connect electrical ground power unit and energize aircraft electrical

network (Ref. 24-41-00, P. Block 301).
(h)Make certain that electronics racks ventilation is correct.
(j)Activate service interphone system (Ref. 23-44-00, P. Block 1).
(k)Remove safety clips and tags and close circuit breakers 1WF and 2WF.

(2)Test

NOTE : The following procedures require the services of two persons, one at zone 311, the other at APU fire control module 20WG and the use of interphone system.

| ACTION | RESULT |
|---|---|
| 1. On connector 11WF-B:<br>- connect 28V DC voltmeter between terminal A and ground, and then between terminal B and ground. | On connector 11WF-B:<br>- Check zero reading between terminals A and B and ground. |
| 2. On APU fire control module 20WG:<br>- pull APU-FIRE/PULL control handle. | On connector 11WF-B:<br>- Check zero reading between terminal A and ground and then terminal B and ground. |
| 3. On APU fire control module 20WG:<br>- press and hold pushbutton switch SQUIB. | On connector 11WF-B:<br>- Check that a 28 V DC reading between terminal A and ground and then between terminal B and ground exists. |
| 4. On APU fire control module 20WG:<br>- release pushbutton switch SQUIB. | On connector 11WF-B:<br>- Check zero reading between terminal A and ground and then terminal B and ground. |
| 5. On APU fire control module 20WG:<br>- return APU-FIRE/PULL handle to stowed position. | |

(3)Close-Up
(a)Open safety and tag circuit breakers 1WF and 2WF.
(b)Deactivate service interphone system (Ref. 23-44-00, P. Block 1).
(c)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).
(d)Remove cap from discharge cartridge electrical connector.
(e)Connect electrical connector (11WF-B) to discharge cartridge on APU

fire extinguisher bottle and safety with lockwire.

(f) On APU fire control module 20WG, install snapwire to APU-FIRE/PULL control handle.

(g) Make certain that working area is clean and clear of tools and miscellaneous items of equipment.

(h) Close access door 313AL.

(j) Remove access platform.

(k) Remove safety clips and tags and close circuit breakers 1WF, 2WF, 2QF, 1QF and 50KA.

## FIRE EXTINGUISHER BOTTLE - REMOVAL/INSTALLATION

**WARNING: BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS ARE ISOLATED.**

**WARNING: PROTECTIVE CAPS MUST BE INSTALLED DURING REMOVAL/INSTALLATION OF BOTTLE, TO PREVENT RUPTURE OF DISCHARGE DIAPHRAGM.**

### 1. Reason for Job

A. Weight check
B. Removal for replacement.

### 2. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| B. | Access Platform, 6 m (20 ft.) |
| C. | Blanking Caps |
| D. | Circuit Breaker Safety Clips |
| E. | Corrosion-Resistant Steel Lockwire, 0.5 mm (0.02 in.) dia. |
| F. | Corrosion-Resistant Steel Lockwire, 0.8 mm (0.032 in.) dia. |
| G. | O-Rings |
| H. | Torque Wrench, up to 75 lbf.ft. (10 m.daN) |
| J. | Allen Key, 3/32 in. |

Referenced Procedures

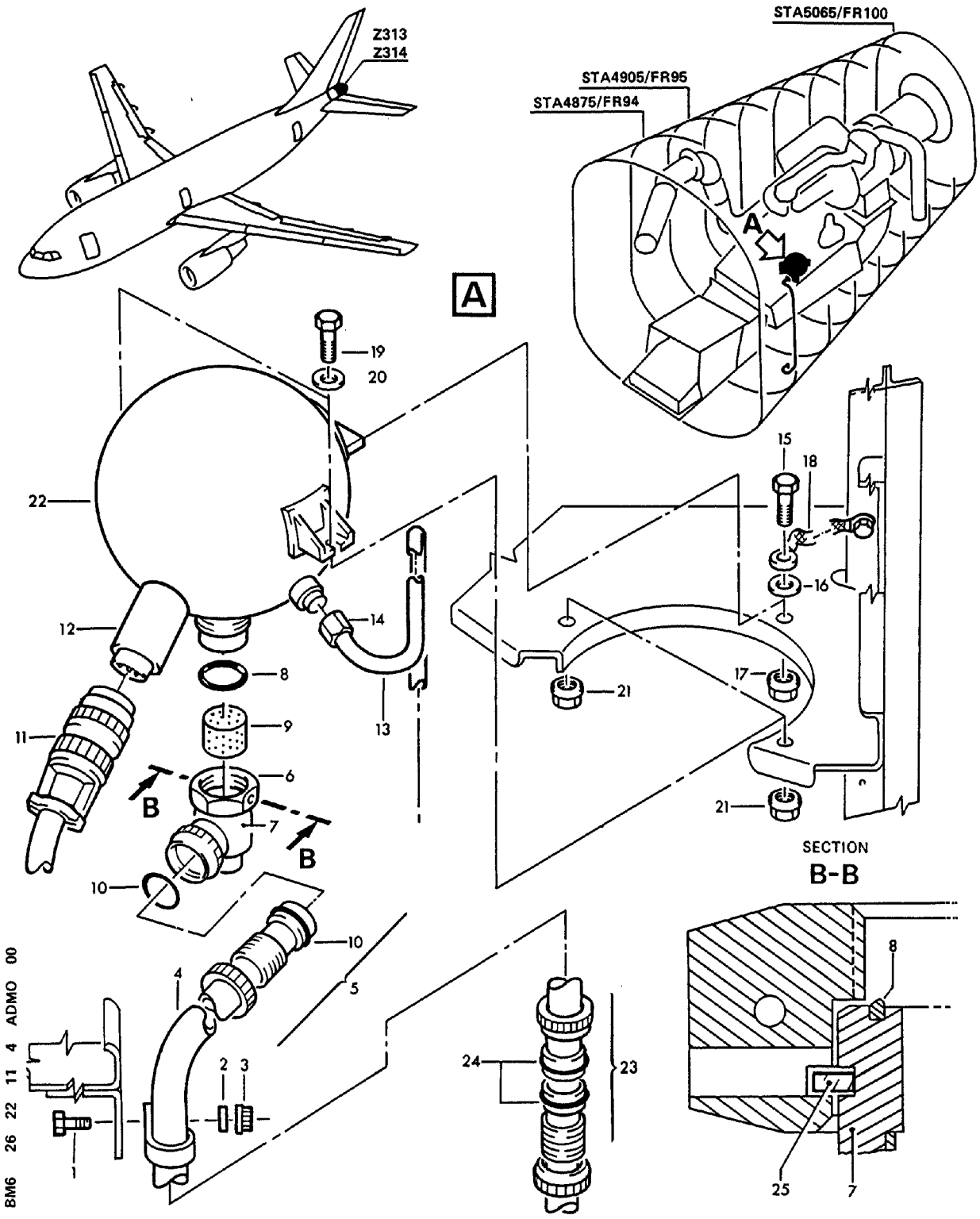
| | |
|---|---|
| - 23-44-00, P. Block 1 | Cabin and Service Interphone |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 26-22-12, P. Block 401 | Discharge Cartridge |

### 3. Procedure

(Ref. Fig. 401)

A. Job Set-Up
(1)Position access platform.
(2)Open access door 313AL.
(3)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | APU/FIRE EXTING/SQUIB TEST | 7WF | A60 |
| 131VU | APU/FIRE EXTING/SQUIB B | 2WF | A61 |
| 131VU | APU/FIRE EXTING/SQUIB A | 1WF | B61 |




Fire Extinguisher Bottle
Figure 401

B. Removal
(1)Discharge Head
(a)Remove discharge cartridge (Ref. 26-22-12, P. Block 401).
(b)Remove bolt (1), washer (2) and nut (3).
(c)Cut and remove lockwire and disconnect union (5).
(d)Cut and remove lockwire from nut (6).

WARNING: PROTECTIVE CAPS MUST BE INSTALLED DURING REMOVAL/INSTALLATION OF BOTTLE, TO PREVENT RUPTURE OF DISCHARGE DIAPHRAGM.

(e)Release nut (6), remove discharge head (7), O-ring (8) and fit protective cap to extinguisher outlet boss. Discard O-ring (8).
(f)Remove O-rings (10).
(2)Fire Extinguisher Bottle
(a)Cut and remove lockwire, disconnect electrical connector (11) and fit blanking caps.
(b)Release fitting (14), separate overpressure discharge line (13) from extinguisher bottle (22) and fit blanking caps.
(c)Remove bolt (15), washer (16), nut (17) and bonding strap (18).
(d)Remove bolts (19), washers (20) and nuts (21).
(e)Remove fire extinguisher bottle (22) and fit blanking caps.

C. Preparation of Replacement Components
(1)Check that gross weight of extinguisher bottle is within ±0.11 lb. (±0.05 kg) of the weight recorded on manufacturer's name plate.

NOTE: Weight check of new bottle is not necessary if NATIONAL REQUERIMENTS are fulfilled.

NOTE: The gross weight of the extinguisher bottle does not include discharge head and cartridge weights. The extinguisher bottle must be rejected if gross weight is not within the stated tolerance.

(2)Check the manufacturing date on the replacement cartridge. Make sure that the maximum combination storage plus service life limit will extend to the next scheduled inspection and in accordance with vendor recommendations.
(3)Check discharge head for serviceability.

NOTE: Check retaining ring (25) via inspection holes for integrity and correct position in discharge head (7).
(4)Remove blanking caps from discharge outlets on replacement bottle.
(5)Check O-rings (10) for serviceability and install onto union (5).
NOTE: If replacement of O-rings (10) is necessary, O-rings (24) on union (23) must also be replaced.
(6)Check filter (9) for serviceability and position in discharge head.
NOTE: Do not remove filter from discharge head until replacement is necessary.

D. Installation

(1)Fire Extinguisher Bottle

(a)Position fire extinguisher bottle (22).

(b)Install bolts (19), washers (20) and nuts (21). Do not tighten at this stage.

(c)Install bolt (15), bonding strap (18), washer (16) and nut (17). Do not tighten at this stage.

(2)Discharge Head

(a)Install O-ring (8). Make certain O-ring is properly seated in groove.

(b)Remove protective cap from extinguisher outlet boss and install discharge head (7). Do not tighten nut (6) at this stage.

(3)Electrical and Distribution Connectors

(a)Connect overpressure discharge line (13). Do not tighten fitting (14) at this stage.

(b)Connect discharge line (4). Do not tighten union (5) at this stage.

(c)Connect union (23), if required, and safety with lockwire 0.8 mm (0.032 in.) dia.

(d)Install bolt (1), washer (2) and nut (3).

(e)Tighten nuts (17, 21) at bottle mounting lugs.

(f)Tighten fitting (14).

(g)Tighten union (5) and safety with lockwire 0.8 mm (0.032 in.) dia.

(h)Tighten discharge head nut (6) and TORQUE to between 40 and 50 lbf.ft. (5.4 and 6.8 m.daN).

(j)Safety discharge head with lockwire 0.8 mm (0.032 in.) dia.

(k)Remove blanking caps, connect electrical connector (11) and safety with lockwire 0.5 mm (0.02 in.) dia.

(l)Install discharge cartridge and connect electrical connector (Ref. 26-22-12, P. Block 401).

E. Test

WARNING: BEFORE CARRYING OUT TEST MAKE CERTAIN THAT FIRE HANDLES ARE NOT PULLED.

(1)Remove safety clips and tags and close circuit breakers 1WF, 2WF and 7WF.

(2)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).

(3)Make certain that electronics racks ventilation is correct.

(4)Activate service interphone system (Ref. 23-44-00, P. Block 1).

(5)Carry out SQUIB TEST as follows:

| ACTION | RESULT |
|---|---|
| 1. On APU fire control module 20VU:<br>- Press and hold pushbutton switch SQUIB TEST. | On APU fire control module 20VU:<br>- Indicator light SQUIB comes on. |
| 2. On APU fire control module 20VU:<br>- Release pushbutton switch SQUIB TEST. | On APU fire control module 20VU:<br>- Indicator light SQUIB goes off. |

(6)Carry out operational test of fire extinguisher bottle pressure switch and electrical circuit as follows:

NOTE: For the following procedure, it is recommended that a minimum of two persons be employed, who are in constant communication, through the aircraft interphone system. One person to monitor cockpit APU fire control module 20VU and the other person positioned at zone 311.

| ACTION | RESULT |
|---|---|
| 1. Insert allen key in hexagon test socket, located on pressure switch on fire extinguisher bottle. Slowly turn allen key approximately 10 degrees in any direction. | On APU fire control module 20VU:<br>- Indicator light DISCH comes on. |
| 2. Slowly let allen key return to initial position and remove. | On APU fire control module 20VU:<br>- Indicator light DISCH goes off. |

NOTE: The allen key must come back by itself to the initial position under the pressure in the fire extinguisher bottle

F. Close-Up

(1)Deactivate service interphone system (Ref. 23-44-00, P. Block 1).
(2)Make sure that working area is clean and clear of tools and other items
(3)Close access door 313AL.
(4)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).
(5)Remove access platform.

## DISCHARGE CARTRIDGE - REMOVAL/INSTALLATION

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS ARE ISOLATED.

R

WARNING : CARTRIDGE ELECTRICAL CONNECTOR PINS MUST BE SHUNTED WITH PLUG 30840007 WHENEVER HANDLING CARTRIDGE.

1. Reasons for the Job

A. Removal of fire extinguisher bottle.

B. Removal due to reaching utilization life limit.

2. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Electrical Ground Power Unit - 3-Phase, 115/200 V, 400 Hz |
| B. | Access Platform, 6 m (20 ft.) |
| C. | Corrosion-Resistant Steel Lockwire, 0.5 mm (0.02 in.) dia. |
| D. | Corrosion-Resistant Steel Lockwire, 0.8 mm (0.032 in.) dia. |
| E. | Blanking Caps |
| F. | Circuit Breaker Safety Clips |
| G. | O-Ring |
| H. | Torque Wrench, up to 1.7 m.daN (150 lbf.in.) |
| J. 30840007 | Shunt Device - Fire Extinguisher Cartridge, HTL |
| Referenced Procedure<br>- 24-41-00, P. Block 301 | AC External Power Control |

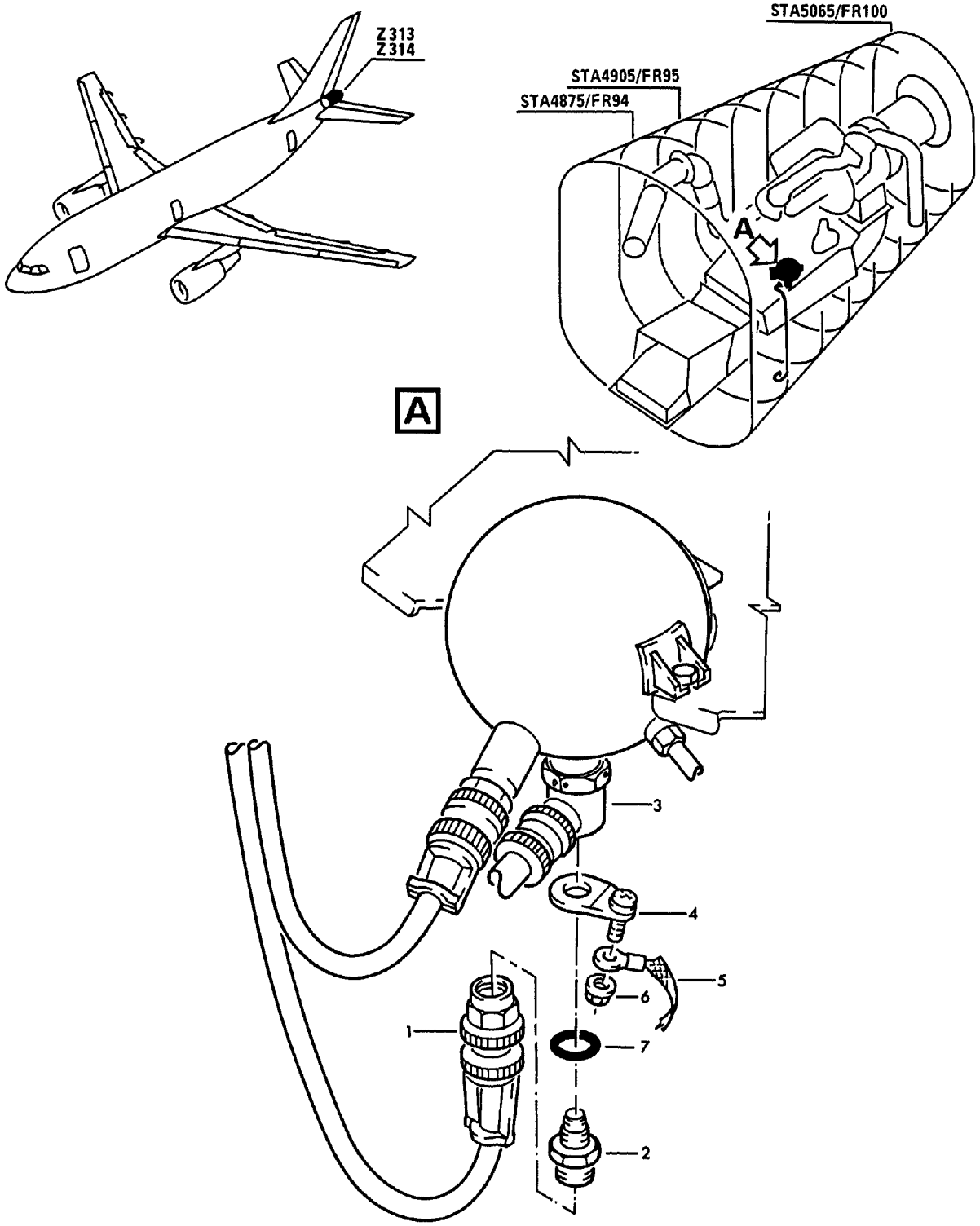
3. Procedure
(Ref. Fig. 401)

A. Job Set-Up

(1)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 131VU | APU/FIRE EXTING/SQUIB TEST | 7WF | A60 |
| 131VU | APU/FIRE EXTING/SQUIB B | 2WF | A61 |
| 131VU | APU/FIRE EXTING/SQUIB A | 1WF | B61 |

(2)Position access platform and open access door 313AL.




Discharge Cartridge
Figure 401

B. Removal
(1)Cut and remove lockwire, disconnect electrical connector (1).
WARNING : CARTRIDGE ELECTRICAL CONNECTOR PINS MUST BE SHUNTED WITH PLUG 30840007 WHENEVER HANDLING CARTRIDGE.
(2)Install shunt plug 30840007 to cartridge electrical connector.
(3)Remove nut (6) and disconnect bonding strap (5).
(4)Cut and remove lockwire and remove discharge cartridge (2) complete with bonding lug (4). Retain bonding lug.
(5)Remove O-ring (7) from discharge cartridge and discard O-ring (7).
(6)Store or discard cartridge in compliance with local regulations.

C. Preparation of Replacement Component
R (1)Examine bonding strap connections for serviceability.
R CAUTION : THE SERVICE LIFE OF THE CARTRIDGE, AS INDICATED BY THE DATE, MUST EXTEND TO THE NEXT SCHEDULED INSPECTION. IF THIS CONDITION IS NOT SATISFIED, REPLACE CARTRIDGE.
R (2)Check the manufacturing date on the replacement cartridge. Make sure that the maximum combination storage plus service life limit will extend to the next scheduled inspection and in accordance with vendor recommendation.
R

D. Installation
(1)Install O-ring (7) to cartridge.
(2)Position bonding lug (4) on replacement cartridge (2).
(3)Install cartridge (2) and TORQUE to between 1.02 and 1.13 m.daN (90 and 100 lbf. in.). Safety with lockwire, 0.8 mm (0.032 in.) dia.
(4)Connect bonding strap (5) to bonding lug (4) and secure with nut (6).
(5)Remove shunt plug 30840007 from cartridge electrical connector.
WARNING : FAILURE TO REMOVE SHUNT DEVICE WILL PREVENT SQUIB FROM FIRING IN CASE OF FIRE.
(6)Check cartridge for any shunt device other than 30840007 shunt plug and remove.
(7)Connect electrical connector (1) and safety with lockwire, 0.5 mm (0.02 in.) dia.

E. Test
(1)Remove safety clip and tag and close circuit breaker 7WF.
(2)Connect electrical ground power unit and energize aircraft electrical network (Ref. 24-41-00, P. Block 301).
(3)Make certain that electronics racks ventilation is correct.
(4)Carry out SQUIB TEST as follows:

| ACTION | RESULT |
|---|---|
| 1. On APU fire control module 20WG:<br>- Press and hold pushbutton switch SQUIB TEST. | On APU fire control module 20WG:<br>- Indicator light SQUIB comes on. |
| 2. On APU fire control module 20WG:<br>- Release pushbutton switch SQUIB TEST. | On APU fire control module 20WG:<br>- Indicator light SQUIB goes off. |

F. Close-Up
(1)Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2)Close access panel 313AL.
(3)Remove access platform.
(4)Remove safety clips and tags and close circuit breakers 1WF and 2WF.
(5)De-energize aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).

# CARGO COMPARTMENT FIRE EXTINGUISHING - DESCRIPTION AND OPERATION

## 1. General

The fire extinguishing system in the FWD and AFT/BULK cargo compartments is so designed that in the event of the smoke detection system becoming activated, the extinguishing agent which is stored in bottles behind the RH sidewall panels of the FWD cargo compartment can be discharged into the appropriate area.

## 2. Component Location

(Ref. Fig. 001)

| FIN | FUNCTIONAL DESIGNATION | PANEL | ZONE | ACCESS DOOR | ATA REF. |
|---|---|---|---|---|---|
| | SPRAY NOZZLE | 131BC | 131 | 811 | |
| | SPRAY NOZZLE | 132FC | 132 | 811 | |
| | SPRAY NOZZLE | 151BC | 151 | 812 | |
| | SPRAY NOZZLE | 161AC | 161 | 813 | |
| 3WM | INDICATOR LIGHT-DISCH 1/DISCH 2 | 433VU | 212 | 831/841 | 26-23-00 |
| 4WM | TOGGLE SWITCH-FWD CARGO COMPT AGENT 1/2 | 433VU | 212 | 831/841 | 26-23-00 |
| 5WM | FIRE EXTINGUISHER BOTTLE 1 | 132NW | 132 | 811 | 26-23-11 |
| 6WM | TOGGLE SWITCH-AFT CARGO COMPT AGENT 1/2 | 433VU | 212 | 831/841 | 26-23-00 |
| 10WM | FIRE EXTINGUISHER BOTTLE 2 | 132NW | 132 | 811 | 26-23-11 |
| | WATER ADSORBING FILTER | | 132 | 811 | 26-23-13 |
| | SOLID PARTICLE FILTER | | 132 | 811 | 26-23-13 |
| | PRESSURE REDUCING VALVE | | 132 | 811 | 26-23-14 |
| | DIAPHRAHM | | 132 | 811 | 26-23-15 |
| | CHECK VALVE | | 132 | 811 | 26-23-16 |
| 13WM | INDICATOR LIGHT-DISCH AGENT 2 | 433VU | 212 | 831/841 | 26-23-00 |
| 14WM | TIME DELAY RELAY | 282VU | 122 | 121BL | 26-23-00 |
| 16WM | RELAY-DISCH 1 INDICATOR LIGHT CONTROL | 282VU | 122 | 121BL | 26-23-00 |
| 17WM | RELAY-DISCH 2 INDICATOR LIGHT CONTROL | 282VU | 122 | 121BL | 26-23-00 |
| 18WM | PUSH BUTTON-SQUIB TEST | 471VU | 212 | 831/841 | 26-23-00 |
| 19WM | TEST MODULE-SQUIB TEST-BOTTLE 1 | 471VU | 212 | 831/841 | 26-23-00 |
| 20WM | TEST MODULE-SQUIB TEST-BOTTLE 2 | 471VU | 212 | 831/841 | 26-23-00 |
| 21WM | INDICATOR LIGHT-SQUIB TEST OK | 471VU | 212 | 831/841 | 26-23-00 |
| 22WM | RELAY-PRIORITY SWITCHING FWD | 282VU | 122 | 121BL | 26-23-00 |
| 23WM | RELAY-PRIORITY SWITCHING AFT | 282VU | 122 | 121BL | 26-23-00 |
| 24WM | RELAY-DISCH AGENT 2 INDICATOR LIGHT CONTROL | 282VU | 122 | 121BL | 26-23-00 |

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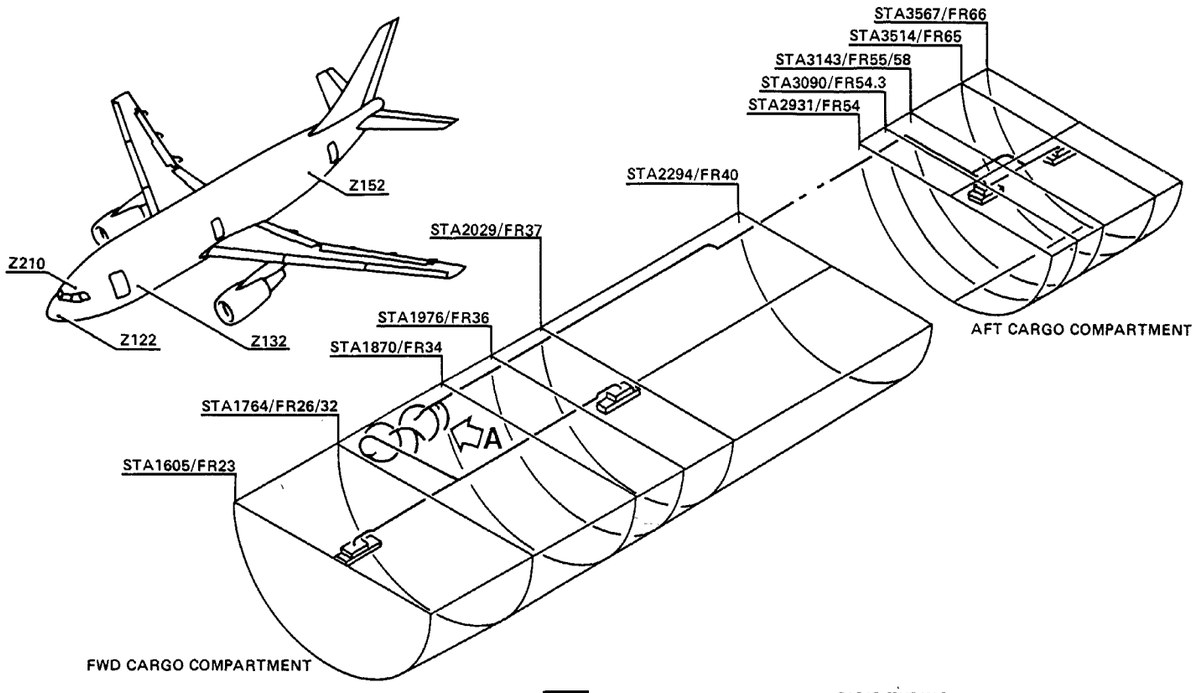


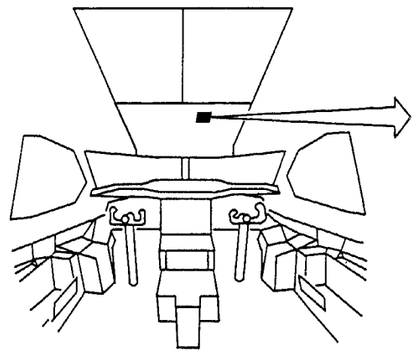

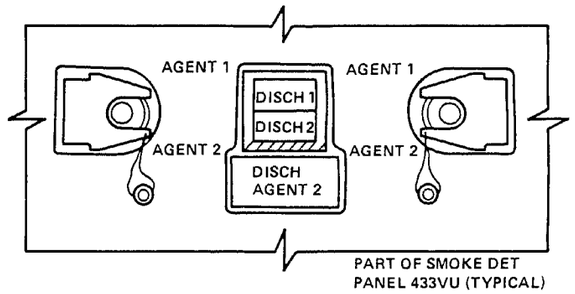


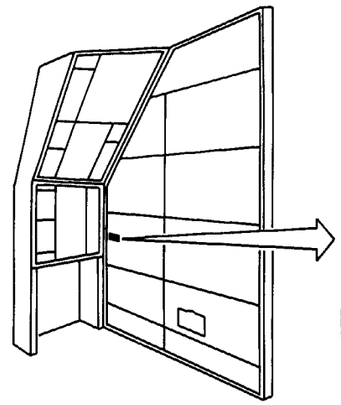

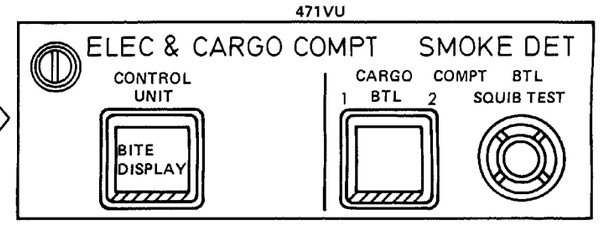


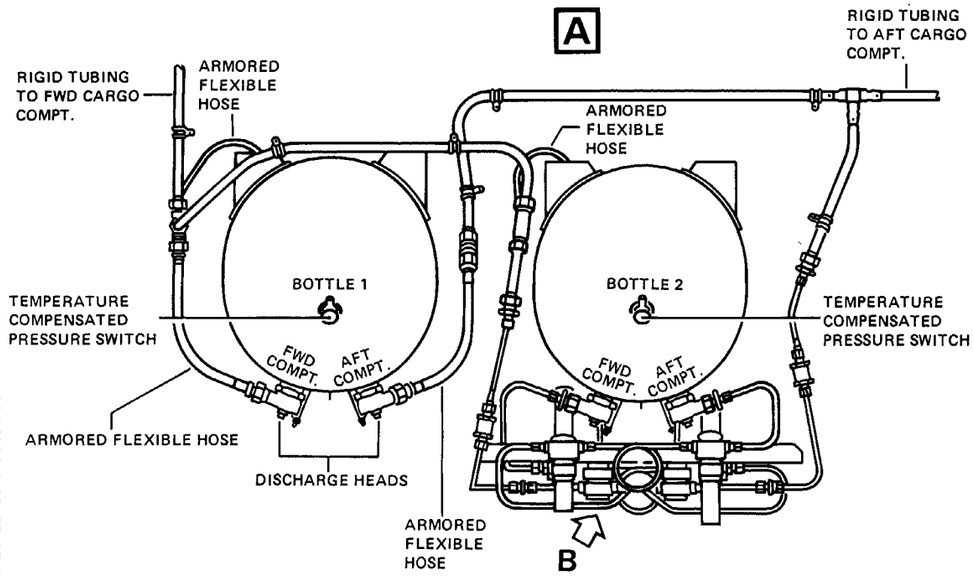


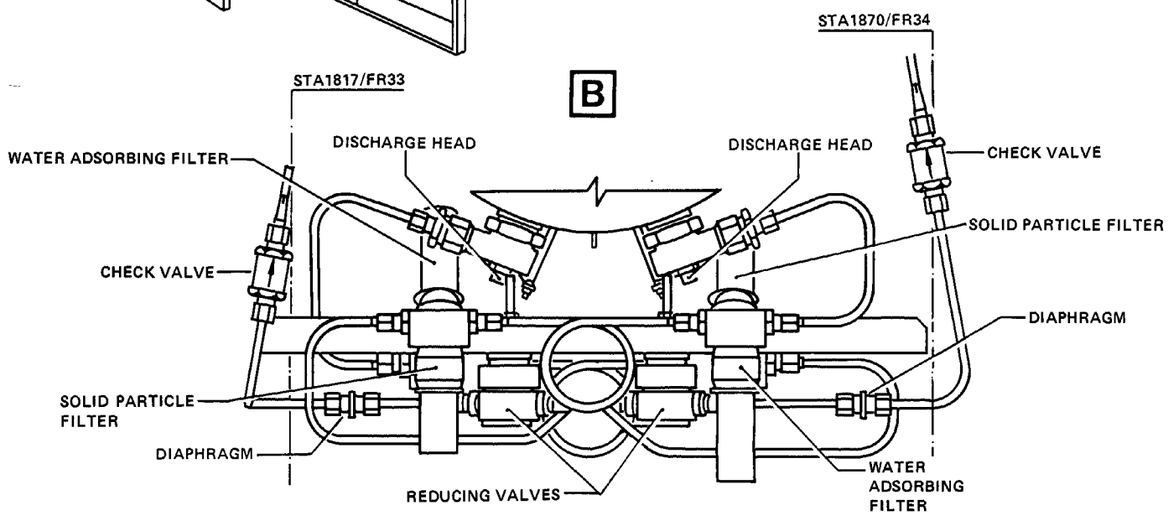


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Cargo Compartment Fire Extinguishing -
Component Location
Figure 001

3. Component Description
(Ref. Fig. 001)

A. Circuit Breaker 1WM rated at 7.5 A supplies 28 V DC from ESS BUS 303PP:
(1)To ignite Bottle 1 AFT Squib via AGENT Selector Switch 6WM.
(2)To ignite Bottle 1 FWD Squib via AGENT Selector Switch 4WM.
(3)To supply BTL 1 OK Indicator Light on SQUIB TEST panel 471VU during squib test.
(4)To energize relays 14WM and 17WM.
(5)To supply DISCH 1 Indicator Light via Light Dimming Relay 254LT (de-energized).
(6)To supply DISCH AGENT 2 Indicator Light via Light Dimming Relay 254LT (de-energized).

B. Circuit Breaker 2WM rated at 7.5 A supplies 28 V DC from BAT BUS 401PP:
(1)To ignite Bottle 2 AFT Squib via AGENT Selector Switch 6WM.
(2)To ignite Bottle 2 FWD Squib via AGENT Selector Switch 4WM.
(3)To supply BTL 2 OK Indicator Light on Squib TEST panel 471VU during squib test.
(4)To energize Relay 16WM.

C. Indicator Light 3WM (DISCH 1/DISCH 2) on Smoke Detector Panel 433VU informs the crew:
(1)That Bottle 1 (DISCH 1) has been discharged or is below its specified internal pressure and is controlled by Low Pressure Switch 5WM via the normally closed (NC) contacts of Relay 17WM.
(2)That Bottle 2 (DISCH 2) has been discharged or is below its specified internal pressure and is controlled by Low Pressure Switch 10WM via the NC contacts of relay 16WM.

D. Toggle Switch 4WM (AGENT 1/AGENT 2) controls the ignition of the Squibs 5WM and 10WM for the FWD cargo compartment and provides 28 V DC to initially energize the Interlock Relay 23WM.

E. Fire Extinguisher Bottle 5WM (Bottle 1) provides storage for the fire extinguishing agent and houses a Low Pressure Switch and two Squibs.

F. Toggle Switch 6WM (AGENT 1/AGENT 2) controls the ignition of the Squibs 5WM and 10WM for the AFT/BULK cargo compartments and provides 28 V DC to initially energize Interlock Relay 22WM.

G. Fire Extinguisher Bottle 10WM (Bottle 2) provides storage for the fire extinguishing agent and houses a Low Pressure Switch and two Squibs.

H. Water Adsorbing Filters are parts of the "Flow Metering" System and are positioned aft of the outlet valves of Fire Extinguisher Bottle 2. Each Water Adsorbing Filter adsorbs the residual quantity of water (max. 20 ppm.) out of the extinguishing agent to prevent icing effects. The required function of the filter will be obtained with a special molecular sieve, which is able to adsorb the water molecules out of the other liquid or gaseous mediums. The molecular sieve has a

crystalline structure, which builds a network of cavities.

I. Solid Particle Filters, positioned after the Water Adsorbing Filters filter all kinds of solid contamination or other particles out of the extingushing agent. The filter element consists of organic and inorganic fibres.

J. Pressure Reducing Valve is a self-contained, spring-loaded pressure reducing regulator in the "Flow Metering" System. It stabilizes the pressure in front of the diaphragm, although the supplied pressure varies depending on the ambient temperature and on the discharging grade. The outlet pressure valve is adjusted to 1.3 bar (18.9 psi) for constant operation.

K. The Diaphragm has to obtain a constant flow rate of the extinguishing agent. This will be achieved by a choke bore, which has a diameter of 1.4 mm (0.055 in.).

L. The Check Valve protects especially the water adsorbing filter and the pressure reducing valve. In normal operation it prevents any saturation of the Water Adsorbing Filter with air moisture, which might occur. Ambient air is sucked into the pipeline system due to cargo compartment pressure variation. Only during a fire within one of the cargo compartments will the valve be pressure-loaded.

M. Indicator Light 13WM (DISCH AGENT 2) comes on to remind the crew to discharge the second bottle and is controlled by Time Delay Relay 14WM.

N. Time Delay Relay 14WM serves as a 60 minute timer. After being constantly energized for 60 minutes, its contacts close and provide a ground signal to DISCH AGENT 2 Indicator Light 13WM which then comes on.

R O. Relay 16WM is controlled by Low Pressure Switch 10WM, when the internal
R pressure of Bottle 1 is too low and the internal pressure of Bottle 2 is
R normal:
R - one normally open (NO) contact of Relay 16WM and one normally
R closed (NC) contact of Relay 17WM pass a ground signal to Time
R Delay Relay 14WM,
R - one NC contact of Relay 17WM passes a ground signal to DISCH 1 Indicator
R Light 3WM.

R P. Relay 17WM is controlled by Low Pressure Switch 5WM, when the internal
R pressure of Bottle 1 and Bottle 2 is too low:
R - one NO contact of Relay 17WM passes a ground signal to DISCH 1 Indicator
R Light 3WM.
R - one NO contact of Relay 16WM passes a ground signal to DISCH 2 Indicator
R Light 3WM.

Q. Pushbutton Switch 18WM (SQUIB TEST) on panel 471VU, when pressed, completes the bias network to Squib Test Module 19WM and Squib Test Module 20WM.

R. Squib Test Module 19WM controls BTL 1 OK Indicator Light 21WM which comes on when P/BSW SQUIB TEST 18WM is pressed and FWD 1 Squib and

AFT 2 Squib are both continuous.

S. Squib Test Module 20WM controls BTL 2 OK Indicator Light 21WM which comes on when P/BSW SQUIB TEST is pressed and FWD 2 Squib and AFT 1 Squib are both continuous.

T. Indicator Light 21WM (BTL 1/2 OK) indicates the serviceability of the Squibs in Bottle 1 and Bottle 2.

U. Interlock Relay 22WM prevents Bottle 2 from being discharged before Bottle 1 into the AFT/BULK cargo compartment.

V. Interlock Relay 23WM prevents Bottle 2 from being discharged before Bottle 1 into the FWD cargo compartment.

W. Relay 24WM switches off the Indicator Light 13WM (DISCH AGENT 2) during discharge of fire extinguisher bottle 2.

4. System Description

Two identical fire extinguisher bottles are located behind the RH sidewall panels of the FWD cargo compartment. Each bottle is equipped with two discharge heads, each situated over rupture discs. Each discharge head is equipped with an electrically ignited explosive device (squib) whose purpose is to penetrate the rupture disc in order to release the extinguishing agent into the fire extinguishing system. Extinguisher bottle 1 is connected to the system via the discharge heads through armoured flexible hoses to rigid pipelines which are connected to spray nozzles located in the FWD, AFT and BULK cargo compartment ceilings.
Extinguisher bottle 2 is connected to the system via the discharge heads and through a "Flow Metering" System, consisting of water adsorbing filters, solid particle filters, pressure reducing valves, diaphragms and check valves, which are positioned in line after the outlet valves on the discharge heads FWD COMPT and AFT COMPT.
The filters and the pressure reducing valves are installed on a support assy below fire extinguisher bottle 2.
The extinguisher bottles are charged with Bromotrifluoromethane (CBrF3) and pressurized with a propellant gas consisting of Nitrogen (N2) to 360 psig at 70 °F (24.8 bars at 21 °C). Both bottles are filled with 70 lb. (31.75 kg) of extinguishing agent.
Both bottles have a pressure relief valve which is connected to the FWD cargo compartment spray nozzles via armoured flexible hoses and the rigid pipeline network. A temperature-compensated pressure switch on each bottle is electrically connected to the DISCH 1/DISCH 2 indicator light on panel 433VU and informs the crew that a bottle has been discharged or that the bottle internal pressure is below the minimum requirement as a result of leakage.
Three brackets, welded to each bottle, provide attachment points to the airframe structure. A SQUIB TEST facility is provided on panel 471VU to check the serviceability of the discharge cartridges (squibs).

5. Operation
(Ref. Fig. 002)

As soon as a smoke warning is given, the air conditioning system in the endangered cargo compartment is automatically switched off. The smoke warning is indicated by a light coming on at the CARGO COMPT SMOKE DET panel

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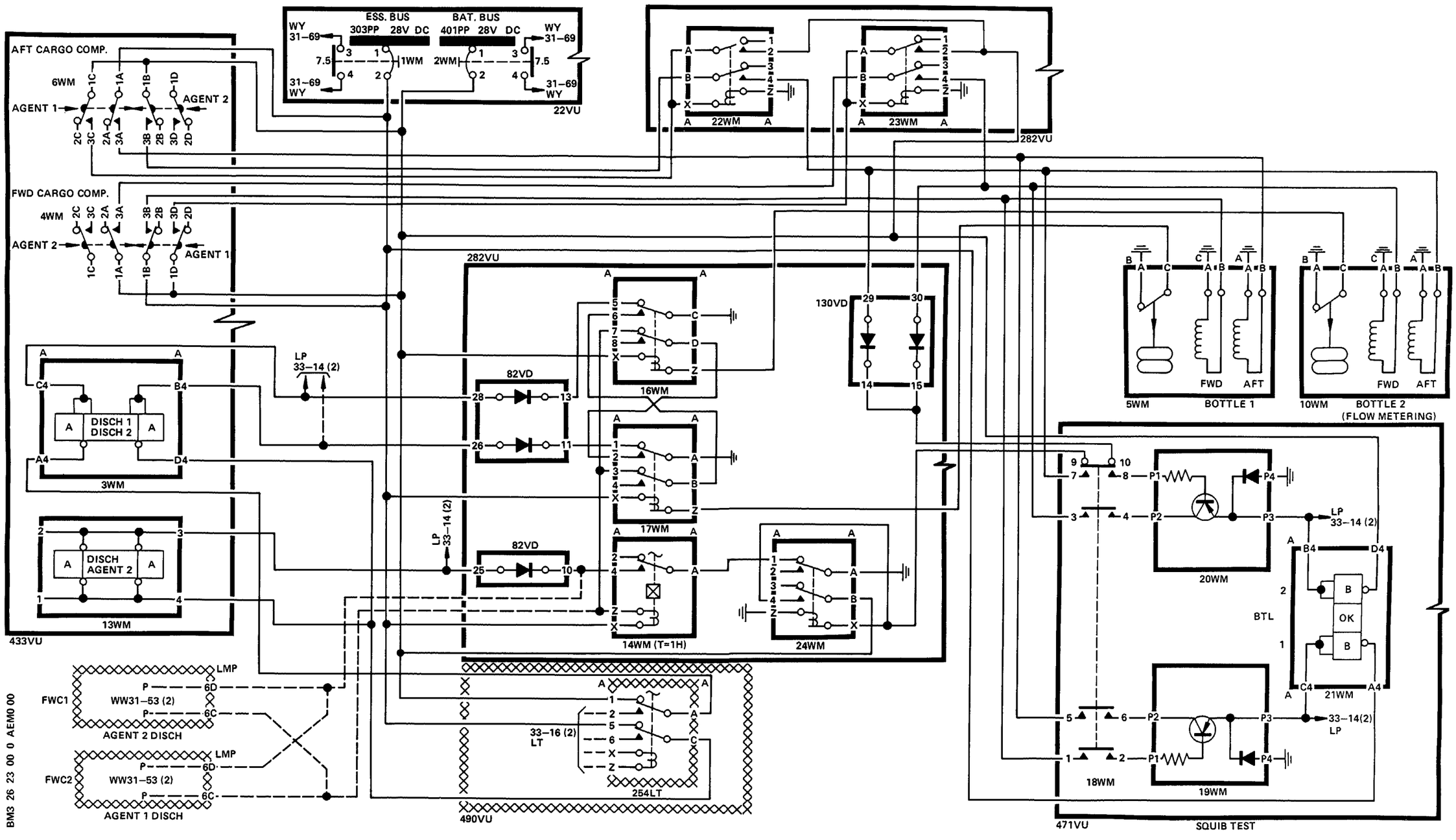


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Cargo Compartment Fire Extinguishing -
Electrical Schematic
Figure 002

433VU. On panel 433VU are two AGENT selector switches which are locked in the neutral position by safety gates and snap-wire. The LH AGENT switch and SMOKE indicator light are for the FWD cargo compartment and the RH AGENT switch and SMOKE indicator light are for the AFT/BULK cargo compartment. Operation of the fire extinguishing system is the same for the FWD cargo compartment and the AFT/BULK cargo compartment. By breaking the snap-wire, opening the safety gate and placing the AGENT switch in AGENT 1 position, the appropriate squib in fire extinguisher bottle 1 will be electrically ignited, rupturing the diaphragm, and the extinguishing agent is forced under pressure through the delivery pipelines and out of the spray nozzles into the appropriate cargo compartment. After a maximum period of 60 seconds, the low pressure indicating system is activated for fire extinguisher bottle 1 and the DISCH 1 indicator light on panel 433VU will come on.
The concentration of extinguishing agent is designed to be sufficiently fire-retardant for 60 minutes. When the fire extinguishing system is initially initiated, a timing circuit is started and after 60 minutes the DISCH AGENT 2 indicator light on panel 433VU comes on, reminding the crew to discharge the second fire extinguisher bottle. The AGENT switch must then be moved to AGENT 2 position.
The appropriate squib in fire extinguisher bottle 2 is electrically ignited, rupturing the diaphragm and discharging the extinguisher agent into the same cargo compartment as before. The DISCH AGENT 2 indicator goes out. After a period of approximately 30 minutes the low pressure indicating system is activated for fire extinguisher bottle 2 and the DISCH 2 indicator light will come on.
An electrical interlock circuit prevents fire extinguisher bottle 2 from being discharged before fire extinguisher bottle 1 and ensures that both bottles are discharged into the same cargo compartment.
The quantity of fire extinguishing agent carried in the system ensures effective fire retarding in the cargo compartment to allow the flight to continue for a period of 260 minutes after fire extinguisher bottle 1 is initially discharged.
A SQUIB TEST facility is provided on panel 471VU for checking the serviceability of all four squibs without electrically igniting them. By pressing the SQUIB TEST pushbutton, BTL 1 OK and BTL 2 OK indicator lights will come on when all squibs are electrically continuous.

1. Squib Test

A. Reason for the Job
(1)To check the continuity of the electrically ignited squibs in the fire extinguisher bottle discharge cartridges.

B. Referenced Procedure
- 24-41-00, P. Block 301 AC External Power Control

C. Procedure
(1)Job Set-Up
(a)Make certain that the following circuit breakers are closed:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | FIRE EXTING/CARGO COMPT/BTL 1 | 1WM | 207/C17 |
| 22VU | FIRE EXTING/CARGO COMPT/BTL 2 | 2WM | 207/C18 |

(b)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(2)Test

| ACTION | RESULT |
|---|---|
| 1. On panel 471VU<br>- Press SQUIB TEST P/BSW 18WM. | On panel 471VU<br>- BTL 1 OK and BTL 2 OK lights come on. |
| 2. On panel 471VU<br>- Release SQUIB TEST P/BSW 18WM. | On panel 471VU<br>- BTL 1 OK and BTL 2 OK lights go off. |

(3)Close-Up
(a)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).

Operational Test of the Percussion Electrical Circuit and Priority Switching

A. Reason for the Job

(1)Continuity check of the electrical circuit by simulating a percussion operation (The squib test check does not use the same circuit).

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 2.5 m (8 ft.) |
| B. | Voltmeter - 28 V DC |
| C. | Lockwire, Corrosion-Resistant Steel, Dia. 0.5 mm (0.02 in.) |
| D. | Snapwire |

Referenced Procedures

| | |
|---|---|
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 25-54-10, P. Block 201 | FWD Cargo Compartment Linings |
| - 52-30-00, P. Block 1 | Cargo Compartment Doors |
| - 52-30-00, P. Block 301 | FWD and AFT Cargo Compartment Doors |

C. Procedure

(1)Job Set-Up

(a)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | FIRE EXTING/CARGO COMPT/BTL 1 | 1WM | 207/C17 |
| 22VU | FIRE EXTING/CARGO COMPT/BTL 2 | 2WM | 207/C18 |

(b)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(c)Position access platform.

(d)Open FWD cargo compartment door (Ref. 52-30-00, P. Block 1).

(e)Install door actuator safety lock on the FWD cargo compartment door actuator (Ref. 52-30-00, P. Block 301).

(f)Remove RH sidewall panels 132NW and 132QW (Ref. 25-54-10, P. Block 201).

(g)On panel 433VU remove snapwire from both AGENT switches.

(h)Remove lockwire and disconnect electrical connectors 5WM-A and 5WM-C from discharge cartridges of fire extinguisher bottle 1.

(i)Remove lockwire and disconnect electrical connectors 10WM-A and 10WM-C from discharge cartridges of fire extinguisher bottle 2.

(j)Remove safety clips and tags and close circuit breakers 1WM and 2WM.

R WARNING : CARTRIDGE ELECTRICAL PINS MUST BE SHUNTED WITH A PROTECTIVE
R SHUNT WHICH IS PROVIDED BY THE MANUFACTURER, A SHUNT PLUG OR
R SHORTING CLIP, TO PREVENT BOTTLE DISCHARGE WHICH COULD CAUSE
R INJURY TO MAINTENANCE PERSONNEL.

(2)Test

NOTE : When a small voltage of not more than 2 V DC is measured where 0 V should be, do the following steps:
- connect a 1 Ohm resistor between the related connector pins
- measure the voltage and the current. The test is correct if the voltage is 0 V and the current 0 mA. If the voltage remains and a current can be measured, trouble-shoot the wiring to isolate the fault.

| ACTION | RESULT |
|---|---|
| 1. FWD cargo compartment<br>- Connect 28 V DC voltmeter between terminals A and B on connectors 5WM-A and 5WM-C. | FWD cargo compartment<br>- 0 V between terminals A and B on connectors 5WM-A and 5WM-C. |
| 2. On panel 433VU<br>- Select both toggle switches AGENT 4WM and 6WM in position AGENT 1. | FWD cargo compartment<br>- 28 V DC between terminals A and B on connectors 5WM-A and 5WM-C. |
| 3. On panel 433VU<br>- Select both toggle switches AGENT 4WM and 6WM in central position. | FWD cargo compartment<br>- 0 V between terminals A and B on connectors 5WM-A and 5WM-C. |
| 4. FWD cargo compartment<br>- Remove voltmeter from connectors 5WM-A and 5WM-C. | |
| 5. FWD cargo compartment<br>- Connect 28 V DC voltmeter between terminals A and B on connectors 10WM-A and 10WM-C. | FWD cargo compartment<br>- 0 V between terminals A and B on connectors 10WM-A and 10WM-C. |
| 6. On panel 433VU<br>- Select both toggle switches AGENT 4WM and 6WM in position AGENT 2. | FWD cargo compartment<br>- 28 V DC between terminals A and B on connectors 10WM-A and 10WM-C. |
| 7. On panel 433VU<br>- Select both toggle switches AGENT 4WM and 6WM in central position. | FWD cargo compartment<br>- 0 V between terminals A and B on connectors 10WM-A and 10WM-C. |
| 8. FWD cargo compartment<br>- Remove voltmeter from connectors 10WM-A and 10WM-C. | |
| 9. On CB panel 22VU<br>- Open and then close circuit breakers 1WM and 2WM. | |
| 10. FWD cargo compartment | FWD cargo compartment |

| ACTION | RESULT |
|---|---|
| - Connect 28 V DC voltmeter between terminals A and B on connector 5WM-C. | - 0 V between terminals A and B on connector 5WM-C. |
| 11. On panel 433VU<br>- Select toggle switch FWD AGENT 4WM in position AGENT 1. | FWD cargo compartment<br>- 28 V DC between terminals A and B on connector 5WM-C. |
| 12. FWD cargo compartment<br>- Disconnect 28 V DC voltmeter from connector 5WM-C and connect between terminals A and B on connectors 10WM-A and 10WM-C. | FWD cargo compartment<br>- 0 V between terminals A and B on connectors 10WM-A and 10WM-C. |
| 13. On panel 433VU<br>- Select toggle switch FWD AGENT 4WM to position AGENT 2. | FWD cargo compartment<br>- 28 V DC between terminals A and B on connector 10WM-C<br>- 0 V between terminals A and B on connector 10WM-A. |
| 14. On panel 433VU<br>- Select toggle switch FWD AGENT 4WM in central position. | |
| 15. On CB panel 22VU<br>- Open and then close circuit breakers 1WM and 2WM. | |
| 16. FWD cargo compartment<br>- Disconnect 28 V DC voltmeter from connector 10WM-A and 10WM-C and connect between terminals A and B on connector 5WM-A. | FWD cargo compartment<br>- 0 V between terminals A and B on connector 5WM-A. |
| 17. On panel 433VU<br>- Select toggle switch AFT AGENT 6WM to position AGENT 1. | FWD cargo compartment<br>- 28 V DC between terminals A and B on connector 5WM-A. |
| 18. FWD cargo compartment<br>- Disconnect 28 V DC voltmeter from connector 5WM-A and connect between terminals A and B on connectors 10WM-A and 10WM-C. | FWD cargo compartment<br>- 0 V between terminals A and B on connectors 10WM-A and 10WM-C. |
| 19. On panel 433VU<br>- Select toggle switch AFT AGENT 6WM to position AGENT 2. | FWD cargo compartment<br>- 28 V DC between terminals A and B on connector 10WM-A<br>- 0 V between terminals A and B on connector 10WM-C. |

| ACTION | RESULT |
|---|---|
| 20. On panel 433VU<br>- Select toggle switch AFT AGENT 6WM in central position. | |
| 21. On CB panel 22VU<br>- Open and then close circuit breakers 1WM and 2WM. | |
| 22. On panel 433VU<br>- Select both toggle switches AGENT 4WM and 6WM to the position AGENT 2. | FWD cargo compartment<br>- 0 V between terminals A and B on connectors 10WM-A and 10WM-C. |
| 23. On panel 433VU<br>- Select both toggle switches AGENT 4WM and 6WM in central position. | FWD cargo compartment<br>- 0 V between terminals A and B on connectors 10WM-A and 10WM-C. |
| 24. FWD cargo compartment<br>- Remove voltmeter from connectors 10WM-A and 10WM-C. | |
| 25. On CB panel 22VU<br>- Open and then close circuit breakers 1WM and 2WM. | |

R **WARNING : BEFORE INSTALLING CARTRIDGE CONNECTOR PLUG, REMOVE PROTECTIVE**
R **SHUNT, SHUNT OR SHORTING CLIP FROM CARTRIDGE ELECTRICAL**
R **PINS. MAKE CERTAIN THAT THERE IS NO SHUNT BETWEEN THE PINS OF**
R **THE CARTRIDGE CONNECTOR PLUG.**

(3)Close-Up
(a)On panel 433VU safety both AGENT switches with snapwire.
(b)Connect electrical connectors 5WM-A and 5WM-C to bottle 1 discharge cartridges and safety with lockwire.
(c)Connect electrical connectors 10WM-A and 10WM-C to bottle 2 discharge cartridges and safety with lockwire.
(d)Carry out squib test (Ref. Para. 1.).
(e)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.
(f)Install RH sidewall panels 132NW and 132QW (Ref. 25-54-10, P. Block 201).
(g)Remove door actuator safety lock (Ref. 52-30-00, P. Block 301).
(h)Close FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(i)Remove access platform.
(j)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).

R **ON A/C 001-100,

3. Functional Flow Test and Leak Test on the Cargo Compartment Fire Extinguishing Lines

WARNING : MAKE CERTAIN THAT ALL UNAUTHORIZED PERSONNEL ARE CLEAR OF THE WORK AREA.

CAUTION : MAKE CERTAIN THAT AN OVERPRESSURE RELIEF VALVE IS INCORPORATED IN THE RIG BEFORE COMMENCING PRESSURE TESTS.

CAUTION : FOR TESTING PURPOSES, ONLY DRY AIR OR NITROGEN MUST BE USED.

CAUTION : WHEN DISCONNECTING PIPES AND HOSES, MAKE CERTAIN THAT NO WATER, OIL ETC. PENETRATES INTO OPEN CONNECTIONS.

A. Reasons for the Job

(1)To establish the serviceability of the fire extinguishing lines.

(2)To check the pressure regulator in the flow metering device for correct function.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platforms, 2.5 m (8 ft.) |
| B. | Dry Air or Nitrogen Rig capable between 5 to 50 bar (73 to 725 psi) |
| C. | Pressure Gauge, 2 bar (29 psi) |
| D. | Pressure Relieve Valve, 17.5 bar (254 psi) |
| E. | Blanking Caps |
| F. | Soap Solution (Castile) and Applicator |

Referenced Procedures

| | |
|---|---|
| - 25-54-10, P. Block 201 | FWD Cargo Compartment Linings |
| - 25-55-10, P. Block 201 | AFT Cargo Compartment Linings |
| - 25-56-00, P. Block 1 | Bulk Cargo Compartment |
| - 26-23-14, P. Block 401 | Pressure Reducing Valve |
| - 52-30-00, P. Block 1 | Cargo Compartment Doors |
| - 52-30-00, P. Block 301 | FWD and AFT Cargo Compartment Doors |

C. Procedure

(1)Job Set-Up

(a)Position access platforms.

(b)Open FWD and AFT cargo compartment doors (Ref. 52-30-00, P. Block 1).

(c)Install door actuator safety locks to FWD and AFT cargo compartment door actuators (Ref. 52-30-00, P. Block 301).

(d)Remove RH sidewall panels between FR26 and FR38.2 (Ref. 25-54-10, P. Block 201).

(e)Remove RH ceiling panels between FR22 and FR38.2 (Ref. 25-54-10, P. Block 201).

(f)Remove LH ceiling panels between FR22 and FR24 (Ref. 25-54-10, P. Block 201).

(g)Remove RH sidewall panels between FR54.2 and FR58 (Ref. 25-55-10, P. Block 201).

(h)Remove RH ceiling panels between FR54.3 and FR60 (Ref. 25-55-10, P. Block 201).
(i)Remove LH ceiling panels between FR54.3 and FR59 (Ref. 25-55-10, P. Block 201).
(j)Remove LH ceiling panels between FR65 and FR66 (Ref. 25-56-00, P. Block 1).
(k)Disconnect flexible hose from overpressure connection, fire extinguisher bottles 1 and 2 and fit suitable blanking caps.
(l)Disconnect flexible hose from outlet valve on discharge heads FWD COMPT and AFT COMPT, fire extinguisher bottle 1.
(m)Connect a dry air or nitrogen supply rig to flexible hoses, disconnected from the outlet valves.

**ON A/C 101-200,

3. Functional Flow Test and Leak Test on the Cargo Compartment Fire Extinguishing Lines

WARNING : MAKE SURE THAT ALL UNAUTHORIZED PERSONNEL ARE CLEAR OF THE WORK AREA.
CAUTION : MAKE SURE THAT AN OVERPRESSURE RELIEF VALVE IS INCORPORATED IN THE RIG BEFORE COMMENCING PRESSURE TESTS.
CAUTION : FOR TESTING PURPOSES, ONLY DRY AIR OR NITROGEN MUST BE USED.
CAUTION : WHEN DISCONNECTING PIPES AND HOSES, MAKE SURE THAT NO WATER, OIL ETC. PENETRATES INTO OPEN CONNECTIONS.

A. Reasons for the Job
(1)To establish the serviceability of the fire extinguishing lines.
(2)To check the pressure regulator in the flow metering device for correct function.

B. Equipment and Materials

| | ITEM | DESIGNATION |
|---|---|---|
| | A. | Access Platforms, 2.5 m (8 ft.) |
| | B. | Dry Air or Nitrogen Rig capable between 5 to 50 bar (73 to 725 psi) |
| | C. | Pressure Gauge, 2 bar (29 psi) |
| | D. | Pressure Relieve Valve, 17.5 bar (254 psi) |
| R | E. | Blanking Plugs for Discharge Lines |
| R | | (MS 21913-10) or equivalent |
| R | F. | Blanking Plugs for Overpressure Hoses |
| R | | (MS 21913-04) or equivalent |
| R | G. | Blanking Caps for Nozzle Connection |
| R | | (MS 21914-10) or equivalent |
| R | H. | Soap Solution (Castile) and Applicator |

Referenced Procedures

| | |
|---|---|
| - 25-54-10, P. Block 201 | FWD Cargo Compartment Linings |
| - 25-55-10, P. Block 201 | AFT Cargo Compartment Linings |
| - 25-56-00, P. Block 1 | Bulk Cargo Compartment |
| - 26-23-14, P. Block 401 | Pressure Reducing Valve |
| - 52-30-00, P. Block 1 | Cargo Compartment Doors |
| - 52-30-00, P. Block 301 | FWD and AFT Cargo Compartment Doors |
| - 28-11-36, P. Block 401 | Additional Center Tank |

C. Procedure
(1)Job Set-Up
(a)Position access platforms.
(b)Open FWD and AFT cargo compartment doors (Ref. 52-30-00, P. Block 1).
(c)Install door actuator safety locks on FWD and AFT cargo compartment door actuators (Ref. 52-30-00, P. Block 301).
(d)Remove RH sidewall panels between FR26 and FR38.2 (Ref. 25-54-10,

P. Block 201).
(e)Remove RH ceiling panels between FR22 and FR38.2 (Ref. 25-54-10, P. Block 201).
(f)Remove LH ceiling panels between FR22 and FR24 (Ref. 25-54-10, P. Block 201).
(g)Remove additional center tank(s) (Ref. 28-11-36, P. Block 401).
(h)Remove RH sidewall panels between FR54.2 and FR58 (Ref. 25-55-10, P. Block 201).
(j)Remove RH ceiling panels between FR54.3 and FR60 (Ref. 25-55-10, P. Block 201).
(k)Remove LH ceiling panels between FR54.3 and FR59 (Ref. 25-55-10, P. Block 201).
(l)Remove LH ceiling panels between FR65 and FR66 (Ref. 25-56-00, P. Block 1).
(m)Disconnect flexible hose from overpressure connection, fire extinguisher bottles 1 and 2 and fit suitable blanking caps.
(n)Disconnect flexible hose from outlet valve on discharge heads FWD COMPT and AFT COMPT, fire extinguisher bottle 1.
(p)Connect a dry air or nitrogen supply rig to flexible hoses, disconnected from the outlet valves.

**ON A/C ALL

(2)Test

| ACTION | RESULT |
|---|---|
| 1. FWD cargo compartment<br>- Pressurize extinguishing delivery lines with 4 to 5 bar (60 to 73 psi)<br>- De-pressurize extinguishing delivery lines | FWD/AFT/BULK cargo compartment<br>- Air or nitrogen flows unhindered from the nozzles in the cargo compartments |
| 2. FWD cargo compartment<br>- Disconnect air or nitrogen supply rig from flexible hoses. Fit suitable blanking caps | |
| 3. FWD cargo compartment<br>- Disconnect pipes from outlet valve on discharge head FWD COMPT and AFT COMPT, fire extinguisher bottle 2.<br>- Slacken nut on inlet connection of water adsorbing filter (green). Swivel pipes sidewards and re-tighten nuts on filter connection | |
| 4. FWD cargo compartment<br>- Connect dry air or nitrogen supply rig to pipes disconnected from outlet valves of bottle 2. | |

| ACTION | RESULT |
|---|---|
| NOTE : When pressurizing the extinguishing delivery lines from the pipe connections disconnected from bottle 2, the flow rate is lower than in case of bottle 1 connection, because the pressure is reduced by a pressure-reducing valve. | |
| - Pressurize extinguishing delivery lines with 4 to 5 bar (60 to 73 psi) | FWD/AFT/BULK cargo compartment<br>- Air or nitrogen flows unhindered from the nozzles into the cargo compartments. |
| - De-pressurize extinguishing delivery lines | |
| 5. FWD cargo compartment<br>- Disconnect air or nitrogen supply rig from pipes disconnected from outlet valves and seal with blanking caps. | |
| 6. FWD cargo compartment<br>- Remove blanking caps from flexible hoses disconnected from the outlet valves of fire extinguisher bottle 1. | |
| 7. FWD cargo compartment<br>- Connect air or nitrogen supply rig to the flexible hose disconnected from the outlet valves. | |
| 8. FWD cargo compartment<br>- Disconnect nuts on the inlet side of both check valves. | |
| 9. FWD and AFT cargo compartments<br>- Remove nozzles and seal with suitable blanking caps. | |

| ACTION | RESULT |
|---|---|

R WARNING : MAKE SURE THAT NO PERSONS ARE IN THE LOWER DECK CARGO COMPARTMENT
R DURING THE TEST. PUT A WARNING NOTICE IN POSITION TO TELL PER-
R SONS NOT TO GO INTO THE LOWER DECK CARGO COMPARTMENT. THE HIGH
R PRESSURE IN THE HOSES/PIPES CAN CAUSE INJURY TO PERSONS AND
R DAMAGE TO THE EQUIPMENT.

| ACTION | RESULT |
|---|---|
| 10. FWD cargo compartment<br>- Slowly pressurize extinguishing delivery lines up to 50 bar (725 psi) and hold this pressure<br>R for 5 minutes. | FWD/AFT/BULK cargo compartments<br>- No leaks visible at the exterior of the extinguishing delivery lines |
| 11. FWD cargo compartment<br>- De-pressurize extinguishing delivery lines<br>- Disconnect air or nitrogen supply rig from flexible hoses and fit blanking caps. | |
| 12. FWD cargo compartment<br>- Fit and retighten nuts on the inlet side of the check valves. | |
| 13. FWD cargo compartment<br>- Remove blanking caps from pipes disconnected from fire extinguisher bottle 2.<br>- Connect dry air or nitrogen supply rig to pipes. | |
| 14. FWD/AFT cargo compartments<br>- Remove one blanking cap each (fitting in the place of the jets) and replace by pressure gage.<br><br>NOTE : The pressure gage must have a measuring range up to 2 bar (29 psi) | |
| R WARNING : MAKE SURE THAT NO PERSONS ARE IN THE LOWER DECK CARGO COMPARTMENT DURING THE TEST. PUT A WARNING NOTICE IN POSITION TO TELL PERSONS NOT TO GO INTO THE LOWER DECK CARGO COMPARTMENT. THE HIGH PRESSURE IN THE HOSES/PIPES CAN CAUSE INJURY TO PERSONS AND DAMAGE TO THE EQUIPMENT. | |
| 15. FWD cargo compartment<br>- Slowly pressurize extinguishing delivery lines to 35 bar (500 psi) and hold this pressure for 5 minutes<br>- Apply soap solution to exterior of extinguishing delivery lines between bottle 2 and both check valves. | FWD/AFT/BULK cargo compartments<br>- Pressure gages indicate a pressure of 1.5 +0.1 -0.15 bar (22 +1.45 -2.18 psi) at all pressure ranges.<br>- No leaks visible at the exterior of the extinguishing delivery lines. |

| ACTION | RESULT |
|---|---|

NOTE : If the gages do not indicate the correct results and no leaks are visible, replace the appropriate pressure reducing valve (Ref. 26-23-14, P. Block 401).

- De-pressurize extinguishing delivery lines.
- Disconnect air or nitrogen supply rig from pipes and fit blanking caps.

16. FWD cargo compartment
- Connect dry air or nitrogen supply rig to the outlet valves of fire extinguisher bottle 2.
- Apply soap solution to exterior of the outlet valves.

R WARNING : MAKE SURE THAT NO PERSONS ARE IN THE LOWER DECK CARGO COMPARTMENT DURING THE TEST. PUT A WARNING NOTICE IN POSITION TO TELL PERSONS NOT TO GO INTO THE LOWER DECK CARGO COMPARTMENT. THE HIGH PRESSURE IN THE HOSES/PIPES CAN CAUSE INJURY TO PERSONS AND DAMAGE TO THE EQUIPMENT.

CAUTION : A SAFETY VALVE WHICH OPENS AT 17.5 bar (254 psi) MUST BE INTEGRATED IN THE TEST SET-UP DURING THE FOLLOWING TEST.

- Slowly pressurize the outlet valves to 17.2 bar (250 psi) and hold this pressure for 5 minutes.
- De-pressurize outlet valves
- Disconnect air or nitrogen supply rig from the outlet valves.

FWD cargo compartment
- No leaks visible at the exterior of the outlet valves.

**ON A/C 001-100,

(3)Close-Up
(a)Slacken nut on the inlet side of the water adsorbing filters (green).
(b)Remove blanking caps and reconnect pipes to the outlet valves of fire extinguisher bottle 2. Tighten nuts.
(c)Remove blanking caps from flexible hoses.
(d)Reconnect flexible hoses to overpressure connections of fire extinguisher bottles 1 and 2.
(e)Reconnect flexible hoses to outlet valves of fire extinguisher

bottle 1.
(f)Remove air or nitrogen supply rig.
(g)Remove pressure gages from nozzles.
(h)Make certain that all blanking caps are removed from system.
(i)Install nozzles to fire extinguisher lines in FWD and AFT cargo compartment.
(j)Remove all traces of soap solution.
(k)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.
(l)Install RH sidewall panels between FR26 and FR38.2 (Ref. 25-54-10, P. Block 201).
(m)Install RH ceiling panels between FR22 and FR38.2 (Ref. 25-54-10, P. Block 201).
(n)Install LH ceiling panels between FR22 and FR24 (Ref. 25-54-10, P. Block 201).
(o)Install RH sidewall panels between FR54.2 and FR58 (Ref. 25-55-10, P. Block 201).
(p)Install RH ceiling panels between FR54.3 and FR60 (Ref. 25-55-10, P. Block 201).
(q)Install LH ceiling panels between FR54.3 and FR59 (Ref. 25-55-10, P. Block 201).
(r)Install LH ceiling panels between FR65 and FR66 (Ref. 25-56-00, P. Block 1).
(s)Remove door actuator safety locks (Ref. 52-30-00, P. Block 301).
(t)Close FWD and AFT cargo compartment doors (Ref. 52-30-00, P. Block 1).
(u)Remove access platforms.

**ON A/C 101-200,

(3)Close-Up
(a)Slacken nut on the inlet side of the water adsorbing filters (green).
(b)Remove blanking caps and reconnect pipes to the outlet valves of fire extinguisher bottle 2. Tighten nuts.
(c)Remove blanking caps from flexible hoses.
(d)Reconnect flexible hoses to overpressure connections of fire extinguisher bottles 1 and 2.
(e)Reconnect flexible hoses to outlet valves of fire extinguisher bottle 1.
(f)Remove air or nitrogen supply rig.
(g)Remove pressure gages from nozzles.
(h)Make certain that all blanking caps are removed from system.
(j)Install nozzles to fire extinguisher lines in FWD and AFT cargo compartment.
(k)Remove all traces of soap solution.
(l)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.
(m)Install RH sidewall panels between FR26 and FR38.2 (Ref. 25-54-10, P. Block 201).
(n)Install RH ceiling panels between FR22 and FR38.2 (Ref. 25-54-10, P. Block 201).
(p)Install LH ceiling panels between FR22 and FR24 (Ref. 25-54-10,

P. Block 201).
(q)Install additional center tank (Ref. 28-11-36, P. Block 401).
(r)Install RH sidewall panels between FR54.2 and FR58 (Ref. 25-55-10, P. Block 201).
(s)Install RH ceiling panels between FR54.3 and FR60 (Ref. 25-55-10, P. Block 201).
(t)Install LH ceiling panels between FR54.3 and FR59 (Ref. 25-55-10, P. Block 201).
(u)Install LH ceiling panels between FR65 and FR66 (Ref. 25-56-00, P. Block 1).
(v)Remove door actuator safety locks (Ref. 52-30-00, P. Block 301).
(w)Close FWD and AFT cargo compartment doors (Ref. 52-30-00, P. Block 1).
(x)Remove access platforms.

**ON A/C ALL

4. Operational Test of Fire Extinguisher Bottle Pressure Drop Indicating Circuit

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS ARE ISOLATED.

NOTE : Make certain that the annunciator lights in cockpit are not dimmed.

A. Reason for the Job

(1)To check the correct operation of the discharge indicator during simulated pressure drop on the cargo compartment fire extinguisher bottle.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 2.5 m (8 ft.) |
| B. | Lockwire, Corrosion-Resistant Steel, Dia. 0.5 mm (0.02 in.) |

Referenced Procedures

| | |
|---|---|
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 25-54-10, P. Block 201 | FWD Cargo Compartment Linings |
| - 52-30-00, P. Block 1 | Cargo Compartment Doors |
| - 52-30-00, P. Block 301 | FWD and AFT Cargo Compartment Doors |

C. Procedure

(1)Job Set-Up

(a)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Position access platform.

(c)Open FWD cargo compartment door (Ref. 52-30-00, P. Block 1).

(d)Install door actuator safety lock to FWD cargo compartment door actuator (Ref. 52-30-00, P. Block 301).

(e)Remove RH sidewall panels 132NW and 132QW (Ref. 25-54-10, P. Block 201).

(f)Make certain that the circuit breakers 1WM and 2WM are closed.

(2)Test

| ACTION | RESULT |
|---|---|
| 1. On panel 433VU<br>- DISCH 1 and 2 indicator lights indicate correct pressure in fire extinguisher bottles 1 and 2 (lights off) | |
| 2. FWD cargo compartment<br>- Disconnect electrical connectors 5WM-B and 10WM-B from pressure switch of fire extinguisher bottles 1 and 2. | On panel 433VU<br>- DISCH 1 AND DISH 2 lights come on. |

| ACTION | RESULT |
|---|---|
| 3. FWD cargo compartment<br>- Reconnect electrical connectors 5WM-B and 10WM-B. | On panel 433VU<br>- DISCH 1 and DISCH 2 lights go off. |

(3)Close-Up
(a)Install sidewall panels 132NW and 132QW (Ref. 25-54-10, P. Block 201).
(b)Remove door actuator safety lock (Ref. 52-30-00, P. Block 301).
(c)Close FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(d)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).
(e)Remove access platform.

5. Functional Test of the Extinguisher Agent Low Concentration Indicating Circuit

A. Reason for the Job
(1)To check the correct delay in discharge of fire extinguisher bottle 2.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 2.5 m (8 ft.) |

Referenced Procedures

| | |
|---|---|
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 25-54-10, P. Block 201 | FWD Cargo Compartment Linings |
| - 52-30-00, P. Block 1 | Cargo Compartment Doors |
| - 52-30-00, P. Block 301 | FWD and AFT Cargo Compartment Doors |

C. Procedure
(1)Job Set-Up
(a)Position access platform.
(b)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(c)Open FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(d)Install door actuator safety lock to FWD cargo compartment door actuator (Ref. 52-30-00, P. Block 301).
(e)Remove RH sidewall panels 132NW and 132QW (Ref. 25-54-10, P. Block 201)
(f)Make certain that the circuit breakers 1WM and 2WM are closed.
(2)Test

| ACTION | RESULT |
|---|---|
| 1. In FWD cargo compartment<br>- Disconnect electrical connector 5WM-B from pressure switch of fire extinguisher bottle 1. Note time. | On panel 433VU<br>- DISCH 1 light comes on. |
| 2. Wait for 60 ±3 minutes to elapse. | On panel 433VU<br>- DISCH AGENT 2 light comes on.<br><br>Aural warning<br>- Single stroke gong sounds. |
| 3. In FWD cargo compartment<br>- Reconnect electrical connector 5WM-B. | On panel 433VU<br>- DISCH AGENT 2 and DISCH 1 lights go off. |

(3)Close-Up
(a)Re-install RH sidewall panels 132NW and 132QW (Ref. 25-54-10, P. Block 201).
(b)Remove door actuator safety lock (Ref. 52-30-00, P. Block 301).

(c)Close FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(d)Remove access platform.
(e)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).

6. Functional Test of the Fire Extinguisher Bottle Pressure Switch

A. Reason for the Job
(1)To check the correct operation of the fire extinguisher bottle pressure switch.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 2.5 m (8 ft.) |
| B. | Ohmmeter, Triplett VOM Model 630A, or equivalent |

Referenced Procedures

| | |
|---|---|
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 25-54-10, P. Block 201 | FWD Cargo Compartment Linings |
| - 26-23-11, P. Block 401 | Fire Extinguisher Bottle |
| - 52-30-00, P. Block 1 | Cargo Compartment Doors |
| - 52-30-00, P. Block 301 | FWD and AFT Cargo Compartment Doors |

C. Procedure
(1)Job Set-Up
(a)Position access platform.
(b)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(c)Open FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(d)Install door actuator safety lock at FWD cargo compartment door actuator (Ref. 52-30-00, P. Block 301).
(e)Remove RH sidewall panels between FR26 and FR34 (Ref. 25-54-10, P. Block 201).
(f)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | FIRE EXTING/CARGO COMPT/BTL 1 | 1WM | 207/C17 |
| 22VU | FIRE EXTING/CARGO COMPT/BTL 2 | 2WM | 207/C18 |

(g)Remove and weigh the fire extinguisher bottle to check if it is charged or discharged (Ref. 26-23-11, P. Block 401).
(h)Attach the ohmmeter to pins 2 and 3 of the fire extinguisher bottle pressure switch.

CAUTION : THE SWITCH IS RATED FOR 0.5 AMPERE MAXIMUM LOAD AT 28 V DC EXCEEDING THIS VALUE COULD AFFECT THE USEFUL LIFE AND RELIABILITY OF THE SWITCH.

(2)Test

| ACTION | RESULT |
|---|---|
| 1. Set ohmmeter to its high sensitivity scale. | Record results<br>- No reading - contacts open (bottle discharged condition) |

| ACTION | RESULT |
|---|---|
| | - Reading - contacts closed (bottle charged condition). |

NOTE : The result of the pressure switch test must coincide with the actual condition of the fire extinguisher bottle as determined by its weight. If this is not the case, the pressure switch is defective and the fire extinguisher bottle must be replaced.

(3)Close-Up
(a)Re-install the fire extinguisher bottle in the aircraft (Ref. 26-23-11, P. Block 401).
(b)Re-install RH sidewall panel between FR26/32 and FR34 (Ref. 25-54-10, P. Block 201).
(c)Remove door actuator safety lock (Ref. 52-30-00, P. Block 301).
(d)Close FWD cargo compartment door (Ref. 52-30-00; P. Block 1).
(e)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).
(f)Remove safety clips and tags and close circuit breakers 1WM and 2WM.
(g)Remove access platform.

7. Functional Test of the Pressure Reducing Valve

A. Reason for the Job
(1)To check the correct operation of the pressure reducing valve.

WARNING : MAKE CERTAIN THAT ALL UNAUTHORIZED PERSONNEL ARE CLEAR OF THE WORK AREA.

CAUTION : MAKE CERTAIN THAT AN OVERPRESSURE RELIEF VALVE IS INCORPORATED IN THE RIG BEFORE COMMENCING PRESSURE TESTS.

CAUTION : FOR TESTING PURPOSES, ONLY DRY AIR OR NITROGEN MUST BE USED.

CAUTION : WHEN DISCONNECTING PIPES AND HOSES, MAKE CERTAIN THAT NO WATER, OIL ETC. PENETRATES INTO OPEN CONNECTIONS.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platforms, 2.5 m (8 ft.) |
| B. | Dry Air or Nitrogen Rig capable between 5 to 35 bar (73 to 508 psi) |
| C. | Pressure Gauge, 2 bar (29 psi) |
| D. | Blanking Caps |
| E. | Soap Solution (Castile) and Applicator |

Referenced Procedures

| | |
|---|---|
| - 25-54-10, P. Block 201 | FWD Cargo Compartment Linings |

- 26-23-14, P. Block 401 Pressure Reducing Valve
- 52-30-00, P. Block 1 Cargo Compartment Doors
- 52-30-00, P. Block 301 FWD and AFT Cargo Compartment Doors

C. Procedure

(1)Job Set-Up

(a)Position access platform.

(b)Open FWD cargo compartment door (Ref. 52-30-00, P. Block 1).

(c)Install door actuator safety lock to FWD cargo compartment door actuator (Ref. 52-30-00, P. Block 301).

(d)Remove RH sidewall panel between FR26 and FR34 (Ref. 25-54-10, P. Block 201).

(e)On fire extinguisher bottle 2:

1 Loosen nuts on pipes of discharge heads (FWD and AFT).

2 Loosen nuts and disconnect pipes from inlet connection of both water absorbing filters (FWD and AFT).

3 Connect dry air or nitrogen supply rig to water absorbing filters.

4 Loosen nuts and disconnect pipes from inlet side of both check valves. Move pipes sidewards.

5 Connect pressure gages with a range up to 2 bar (29 psi) to both disconnected pipes.

6 Fit blanking caps to the open connections.

(2)Test

| ACTION | RESULT |
|---|---|
| 1. FWD cargo compartment<br>- Slowly pressurize extinguishing delivery lines up to 35 bar (500 psi) and hold this pressure for 5 minutes | FWD cargo compartment<br>- Pressure gages indicate a pressure of 1.5 +0.1 -0.15 bar (22 +1.45 -2.18 psi) at all pressure ranges. |
| - If the pressure gage does not indicate the correct pressure:<br>Apply soap solution to exterior of extinguishing delivery lines between water absorbing filters and diaphragms. | - No leaks visible at the exterior of the extinguishing delivery lines. |
| NOTE : If the gages do not indicate the correct results and no leaks are visible, replace the appropriate pressure reducing valve (Ref. 26-23-14, P. Block 401). | |
| - De-pressurize extinguishing delivery lines. | |

3. Close-Up

(a)Disconnect air or nitrogen supply rig.

(b)Remove pressure gages from both pipes at inlet side of check valves.

(c)Remove blanking caps and reconnect pipes to inlet side of both check valves.

(d)Remove blanking caps and reconnect pipes to both water absorbing filters.

(e)Tighten nuts of pipes at discharge heads, water absorbing filters and check valves.
(f)Remove all traces of soap solution.
(g)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.
(h)Install RH sidewall panel between FR26 and FR34 (Ref. 25-54-10, P. Block 201).

WARNING : MAKE CERTAIN THAT WARNING NOTICES ARE IN CORRECT POSITION TO PREVENT INADVERTENT ACTUATION OF THE FIRE EXTINGUISHING SYSTEM.

WARNING : THE DISCHARGED EXTINGUISHING AGENT EXPELS OXYGEN FROM THE SURROUNDING AREA. THE WORK AREA MUST BE VENTILATED IN CASE THE EXTINGUISHING AGENT IS DISCHARGED INADVERTENTLY.

CAUTION : WHEN DISCONNECTING PIPES, MAKE CERTAIN THAT NO WATER, OIL ETC. PENETRATES INTO OPEN CONNECTIONS.

1. Inspection of the Solid Particle Filter, Check Valve and Diaphragm

A. Reason for the Job

To inspect flow metering device components in removed position.

B. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 2.5 m (8 ft.) |
| B. | Blanking Caps |

Referenced Procedures

| | |
|---|---|
| R - 26-23-00, P. Block 501 | Cargo Compartment Fire Extinguishing |
| - 26-23-13, P. Block 301 | Water Absorbing and Solid Particle Filter |
| - 26-23-15, P. Block 201 | Check Valve |
| - 26-23-16, P. Block 201 | Diaphragm |
| - 52-30-00, P. Block 1 | Cargo Compartment Doors |
| - 52-30-00, P. Block 301 | FWD and AFT Cargo Compartment Doors |

C. Procedure

(1)Job Set-Up
(a)Position access platform.
(b)Open FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(c)Install door actuator safety lock to FWD cargo compartment door actuator (Ref. 52-30-00, P. Block 301).
(d)Remove the solid particle filter element (Ref. 26-23-13, P. Block 301).
(e)Remove the check valve (Ref. 26-23-15, P. Block 201).
(f)Remove the diaphragm (Ref. 26-23-16, P. Block 201).
(2)Inspection of the solid particle filter and element, check valve and diaphragm.
(a)Solid particle filter
1 Inspect filter element for cleanness and damage.
2 Inspect filter head and filter bowl to make sure that the inside and outside are clean, the openings are not obstructed.
(b)Check Valve
1 Disassemble check valve (Ref. 26-23-15, P. Block 201).

2 Operate the swing element of the check valve manually to open position and make sure that it snaps closed in the inverted position.
3 Make sure that the seat of the swing element is flat without uneven extrusion.
4 Make sure that the seating surface on the check valve body is clean and smooth.
5 Assemble check valve (Ref. 26-23-15, P. Block 201).

(c)Diaphragm
1 Inspect inside and outside of diaphragm for cleanness, damage and corrosion.
2 Make sure that the orifice is not obstructed.

(3)Close-Up
(a)Install diaphragm (Ref. 26-23-16, P. Block 201).
(b)Install check valve (Ref. 26-23-15, P. Block 201).
(c)Install solid particle filter element (Ref. 26-23-13, P. Block 301).
(d)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.
(e)Remove door actuator safety lock (Ref. 52-30-00, P. Block 301).
(f)Close FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(g)Remove access platform.

## CARGO COMPARTMENT FIRE EXTINGUISHING - DEACTIVATION/REACTIVATION

REF : MMEL Sect 1-26 Item 12
WARNING : DISCHARGE CARTRIDGES ARE CLASS 'C' EXPLOSIVES AND MUST ONLY BE HANDLED/STORED BY AUTHORIZED PERSONNEL.
WARNING : THE DISCHARGED EXTINGUISHING AGENT EXPELS OXYGEN FROM THE SURROUNDING AREA. THE WORKING AREA MUST BE VENTILATED IN CASE THE EXTINGUISHING AGENT IS DISCHARGED INADVERTENTLY.
CAUTION : THIS PROCEDURE IS TO BE USED ACCORDING TO THE REQUIREMENTS OF THE MMEL.

1. Reason for the Job

A. To weigh one of the fire extinguishing bottles the associated DISCH light of which is found to be inoperative and not immediately repairable.

2. Referenced Procedure

- 26-23-11, P. Block 401 Fire Extinguisher Bottle

3. Procedure

A. Job Set-Up
(1)Remove fire extinguisher bottle (Ref. 26-23-11, P. Block 401).

R NOTE : Do not remove the cartridges and discharge outlets.

B. Weighing of Fire Extinguisher Bottle
(1)Check that the gross weight of fire extinguisher bottle is within ± 0.41 kg (± 0.9 lb) of the weight recorded on manufacturer's nameplate.
NOTE : The gross weight of the fire extinguisher bottle is measured with outlet valves and cartridges fitted. The bottle must be rejected if the weight is not within the tolerances stated.

R NOTE : The gross weight given on the name plates for the extinguisher
R bottles PN 35200001 and PN 35200002-2 does not include the
R cartridges, discharge outlets and protective caps.
R Add a weight of 0.3 kg (0.67 lb.) to get the gross weight for
R these bottles including cartridges, discharge outlets and
R protective caps.

C. Installation
(1)Install fire extinguisher bottle (Ref. 26-23-11, P. Block 401).

## FIRE EXTINGUISHER BOTTLE - REMOVAL/INSTALLATION

WARNING : MAKE CERTAIN THAT WARNING NOTICES ARE IN CORRECT POSITION TO PREVENT INADVERTENT ACTIVATION OF THE FIRE EXTINGUISHING SYSTEM.

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS ARE ISOLATED.

WARNING : AS THE DISCHARGE CARTRIDGES ARE EXPLOSIVE, REMOVE THEM BEFORE WORKING ON THE FIRE EXTINGUISHER BOTTLE.

WARNING : PRESSURE HOLDING BLANKING CAPS MUST BE INSTALLED DURING BOTTLE REMOVAL/INSTALLATION TO PREVENT RUPTURE OF DISCHARGE DIAPHRAGM.

WARNING : THE DISCHARGED EXTINGUISHING AGENT EXPELS OXYGEN FROM THE SURROUNDING AREA. THE WORKING AREA MUST BE VENTILATED IN CASE THE EXTINGUISHING AGENT IS DISCHARGED INADVERTENTLY.

WARNING : EXTINGUISHER BOTTLE WEIGHS APPROXIMATELY 40 kg (88 lb.). TO AVOID INJURY AND DAMAGE, MAKE CERTAIN THAT ADEQUATE SUPPORT IS AVAILABLE BEFORE DISCONNECTING ATTACHING PARTS.

### 1. Reasons for the Job

A. Removal due to reaching time between scheduled replacement.

B. Removal prior to weighing extinguisher bottle(s).

C. Removal prior to performing extinguisher bottle hydrostatic test.

D. To replace discharged extinguisher bottle.

### 2. Equipment and Materials

| | ITEM | DESIGNATION |
|---|---|---|
| | A. | Access Platform, 2.5 m (8 ft.) |
| | B. | Torque Wrench, 1.69 to 6.7 m.daN (150 to 600 lbf.in.) |
| | C. | Blanking Caps |
| | D. 10-101950-81 | Shunt Plug |
| | E. | Circuit Breaker Safety Clips and Tags |
| | F. | Lockwire, Corrosion-Resistant Steel, Dia. 0.8 mm (0.032 in.) |
| | G. | Lockwire, Corrosion-Resistant Steel, Dia. 0.5 mm (0.02 in.) |
| | H. | Lockwasher |
| | I. | O-Rings |
| | J. | Nuts |
| | K. Material No. 04-001 | Common Greases (Ref. 20-31-00) |
| R | L. 98F26208551000 | 1 TROLLEY - FIRE EXTINGUISHER BOTTLES |
| R | M. 98F26208586001 | 1 DEVICE - REMOVAL INSTALLATION, FIRE EXTINGUISHER |

Referenced Procedures

| | |
|---|---|
| - 24-41-00, P. Block 301 | AC External Power Control |

- 25-54-10, P. Block 201 FWD Cargo Compartment Linings
- 26-23-12, P. Block 401 Discharge Cartridge
- 52-30-00, P. Block 1 Cargo Compartment Doors
- 52-30-00, P. Block 301 FWD and AFT Cargo Compartment Doors

3. Procedure

(Ref. Fig. 401)

**ON A/C 001-100, 105-200,

Post SB 26-2027 For A/C 001-100,105-200,

(Ref. Fig. 402)

R **ON A/C ALL

R (Ref. Fig. 403)

R

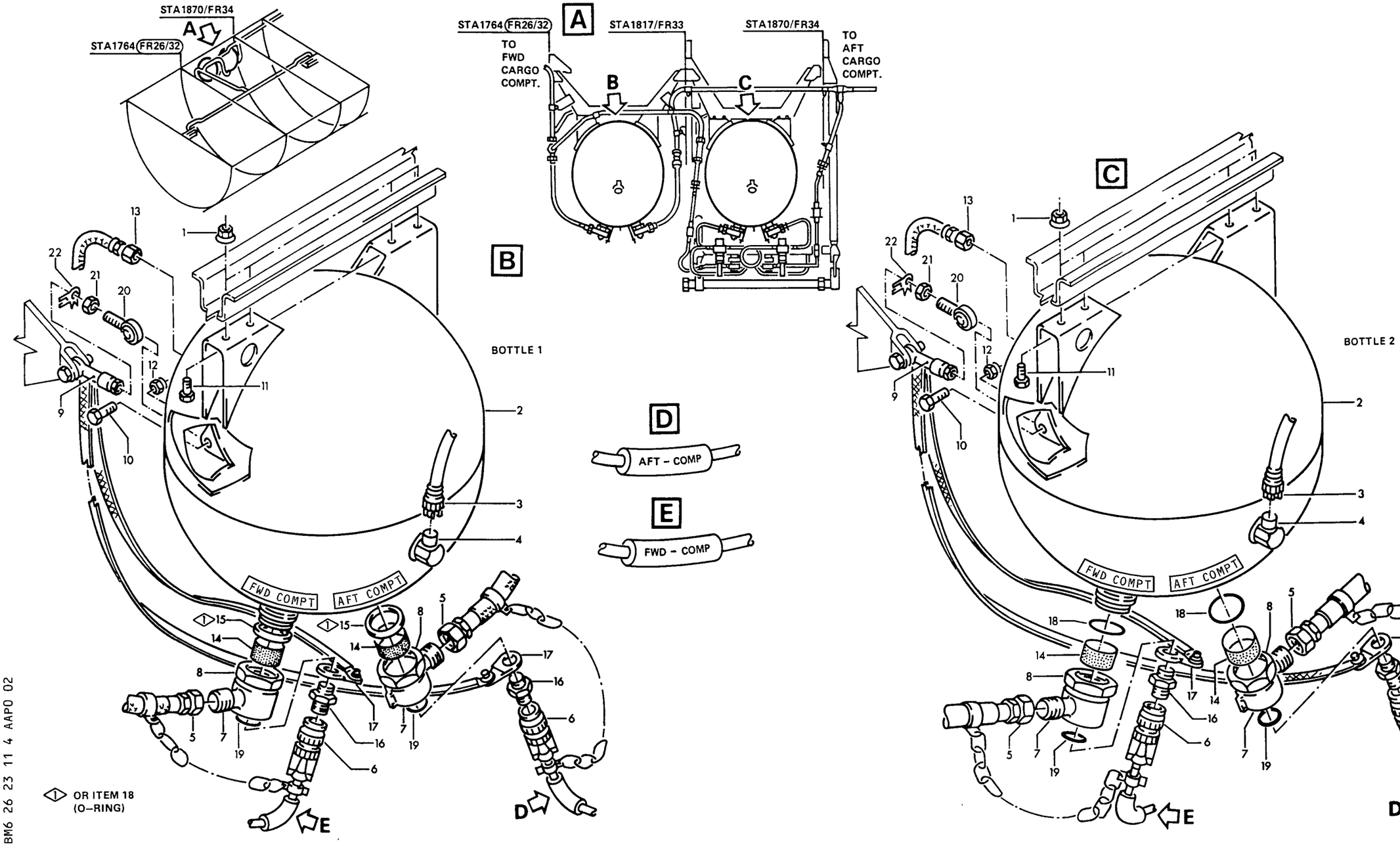
A. Job Set-Up
(1)Position access platform.
(2)Open FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(3)Install door actuator safety lock to FWD cargo compartment door actuator (Ref. 52-30-00, P. Block 301).
(4)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | FIRE EXTING/CARGO COMPT/BTL 1 | 1WM | 207/C17 |
| 22VU | FIRE EXTING/CARGO COMPT/BTL 2 | 2WM | 207/C18 |

(5)Remove RH sidewall panels from STA1763/FR26 to STA1975/FR36 (Ref. 25-54-10, P. Block 201).
(6)Remove electrical connectors (6), discharge cartridge (16), O-ring (19) and bonding strap (17) (Ref. 26-23-12, P. Block 401.).

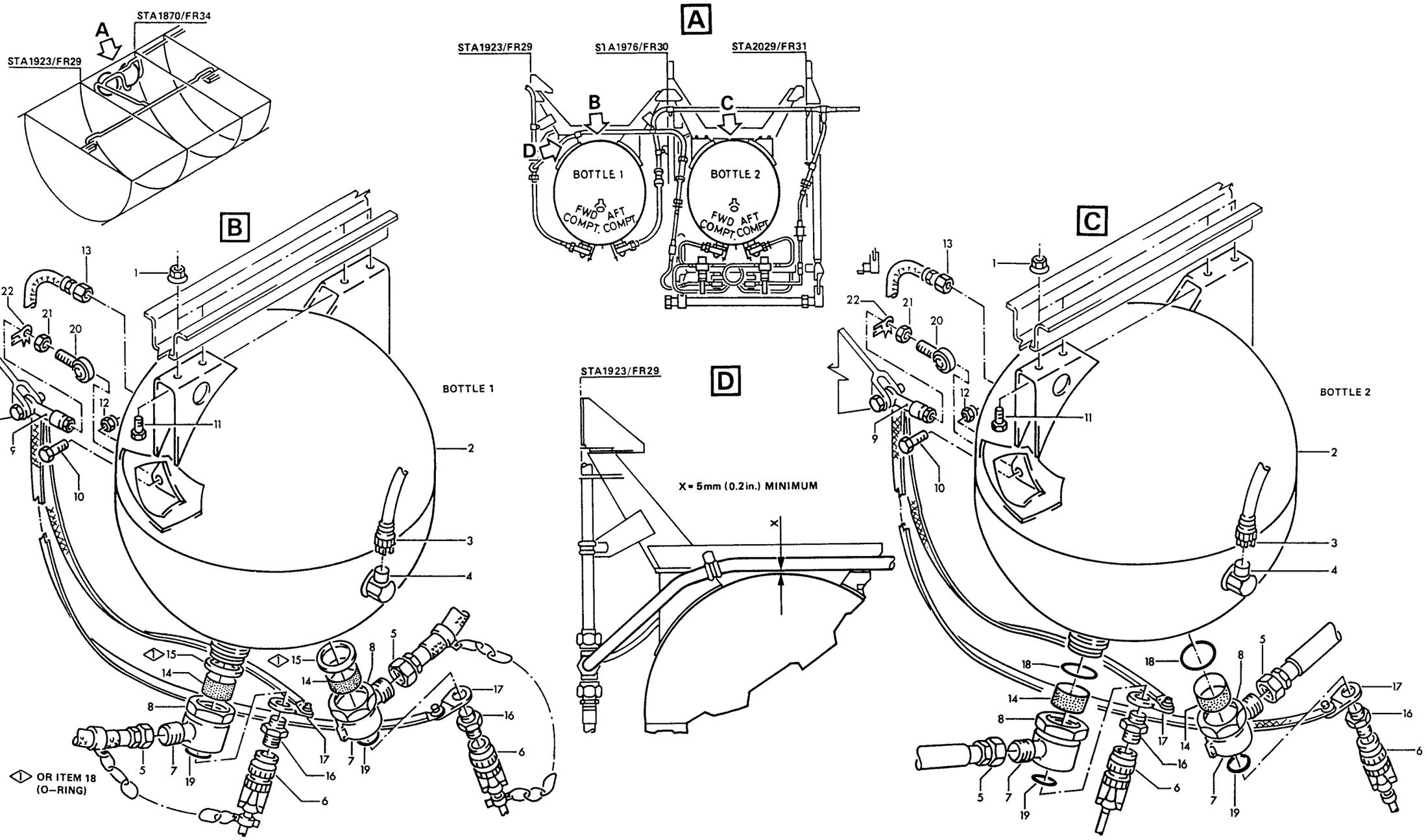
B. Removal

R WARNING : BE VERY CAREFUL WHEN YOU MOVE A FILLED FIRE EXTINGUISHER
R BOTTLE. A HEAVY SHOCK COULD CAUSE UNWANTED DISCHARGE AND INJURY
R TO PERSONS.



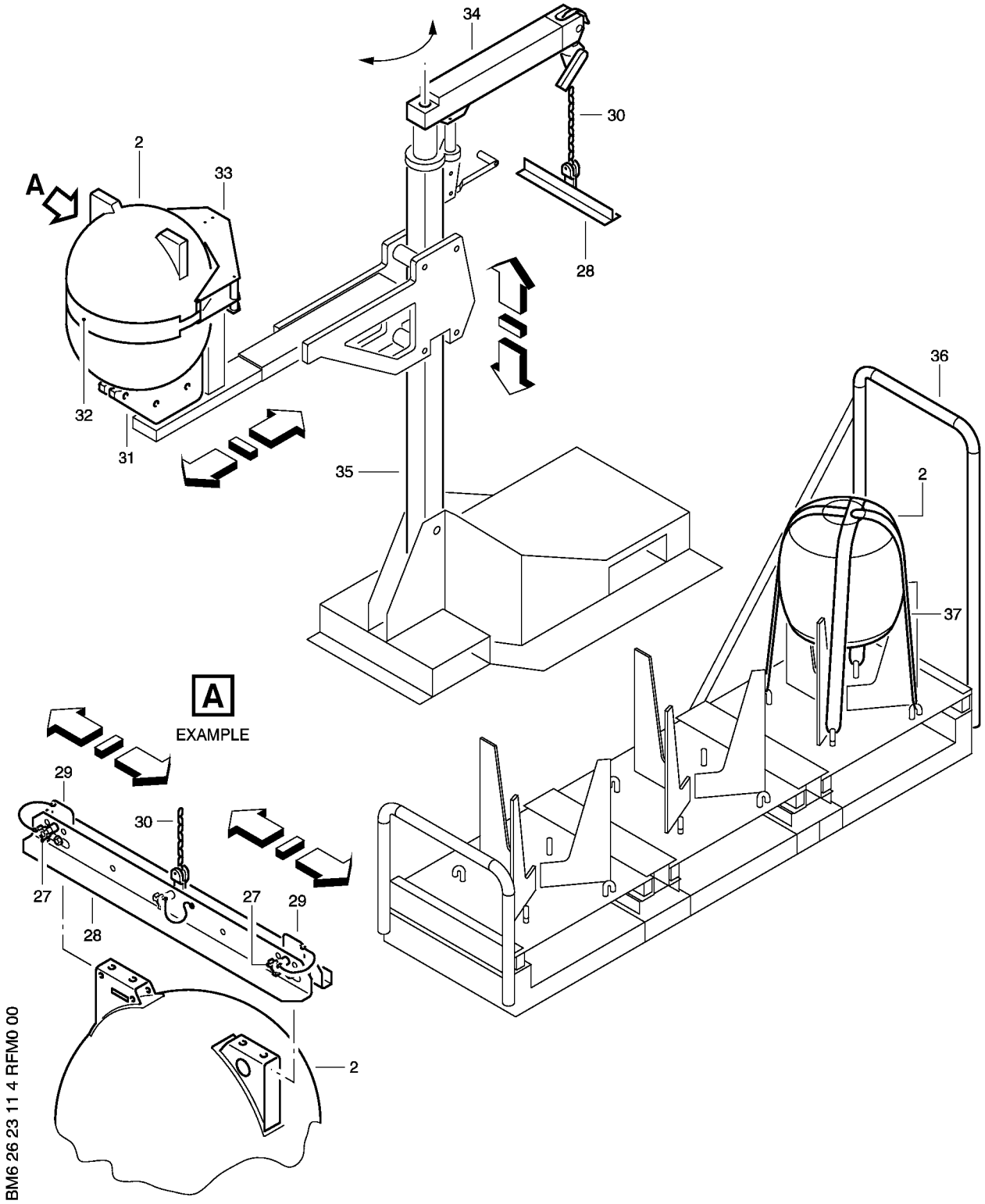

BM6 26 23 11 4 AAP0 02

Fire Extinguisher Bottles
Figure 401




IM6 26 23 11 4 NYM0 01

Fire Extinguisher Bottles
Figure 402




Fire Extinguisher Bottles
Figure 403

R

R NOTE : Two mechanics are necessary to remove the fire-extinguisher bottle.

(1)Outlet Valve

** On Fire Extinguisher Bottle 1

(a)Slacken nut (5) and disconnect flexible hoses from outlet valves (7).
(b)Cut and remove lockwire from nuts (8).
(c)Slacken nuts (8) and disconnect outlet valves (7) complete with filters (14) and swivel rings (15) or O-rings (18) from extinguisher bottle (2). Discard O-ring (18).
(d)Remove and discard O-ring (19).
(e)Install pressure holding blanking cap on bottle outlet and on other connections fit standard blanking caps.

** On Fire Extinguisher Bottle 2

CAUTION : WHEN DISCONNECTING PIPES, MAKE CERTAIN THAT NO WATER, OIL ETC. PENETRATES INTO OPEN CONNECTIONS.

(a)Slacken nut (5) and disconnect pipe from outlet valves (7).
(b)Fit blanking caps to pipes.
(c)Cut and remove lockwire from nuts (8).
(d)Slacken nuts (8) and disconnect outlet valves (7) complete with filters (14) from extinguisher bottle (2).
(e)Remove and discard O-rings (18),(19).
(f)Install pressure holding blanking cap on bottle outlet and on other connections fit standard blanking caps.

** On Fire Extinguisher Bottles 1 and 2

(2)Fire Extinguisher Bottles
(a)Disconnect electrical connector (3) from pressure switch (4).
(b)Fit blanking caps.
(c)Disconnect hose (13) from extinguisher bottle (2) overpressure connection.
(d)Fit blanking caps.
R (e)Put the DEVICE - REMOVAL INSTALLATION, FIRE EXTINGUISHER (35) in
R position at the fire-extinguisher bottle (2).
R (f)Lift the carriage (31) until it supports the fire-extinguisher
R bottle (2).
R (g)Put the belt (32) around the fire-extinguisher bottle (2) to safety
R the fire-extinguisher bottle (2).
R (h)Remove nut (12) and bolt (10) and disconnect support strut (9) from bottle (2).

WARNING : EACH EXTINGUISHER BOTTLE WEIGHS APPROX. 40 kg (88 lb.).

R (i)Remove nuts (1) and bolts (11).
R (j)Discard nuts (1) and (12).
R (k)Move the carriage (31) inboard.
R (l)Lower the carriage (31) until it is on the bottom stop position.

R (m)Installation of the Lift Fixture:
R 1 Engage the hooks (29) of the lift fixture (28) on the fire-extinguisher bottle (2).
R 2 Attach the lift fixture (28) to the fire-extinguisher bottle (2) with the pins (27).
R (n)Remove the belt (32) from the fire-extinguisher bottle (2).
R (o)Remove the gripping device (33) from the DEVICE - REMOVAL INSTALLATION, FIRE EXTINGUISHER (35).
R (p)Lift the fire-extinguisher bottle (2) with the chain (30) until it is free from the carriage (31).
R (q)Turn the rotary arm (34) 180 deg (180.0000 deg) counterclockwise.
R (r)Carefully lower the fire-extinguisher bottle (2) until it is on the TROLLEY - FIRE EXTINGUISHER BOTTLES (36).
R (s)Removal of the Lift Fixture:
R 1 Disengage the pins (27).
R 2 Disengage the hooks (29) from the fire-extinguisher bottle (2) and remove the lift fixture (28).
R (t)Safety the fire-extinguisher bottle (2) with the belt (37).

C. Preparation of Replacement Components

(1)Refer to the name plate and check gross weight of fire extinguisher bottles (Ref. 26-23-00, P. Block 901).

NOTE : The gross weight given on name plate includes weight for cartridges and discharge outlets except for fire extinguisher bottles PN 35200001 and PN 35200002-2 which does not include weight for cartridges, discharge outlets and protective caps. Subtract 0.3 kg (0.67 lb.) to get the correct weight of fire extinguisher bottles without cartridges, discharge outlets and protective caps installed.

(2)Examine outlet valves and all removed components for serviceability.
(3)In case bottle 2 has been discharged:
(a)Replace particle filter elements and water absorbing filter elements (Ref. 26-23-13, P. Block 301).

D. Installation

R WARNING : BE VERY CAREFUL WHEN YOU MOVE A FILLED FIRE EXTINGUISHER BOTTLE. A HEAVY SHOCK COULD CAUSE UNWANTED DISCHARGE AND INJURY TO PERSONS.

R NOTE : Two mechanics are necessary to install the fire-extinguisher bottle.

(1)Fire Extinguisher Bottles

** On Fire Extinguisher Bottle 1 and 2

R (a)Put the fire-extinguisher bottle (2) in position with the **TROLLEY - FIRE EXTINGUISHER BOTTLES (36)**.
R (b)Remove the belt (37) from the fire-extinguisher bottle (2).
R (c)Installation of the Lift Fixture:
R 1 Engage the hooks (29) of the lift fixture (28) on the fire-extinguisher bottle (2).
R 2 Attach the lift fixture (28) to the fire-extinguisher bottle (2) with the pins (27).
R (d)Lift the fire-extinguisher bottle (2) with the chain (30) from the **TROLLEY - FIRE EXTINGUISHER BOTTLES (36)** until it is free from the **TROLLEY - FIRE EXTINGUISHER BOTTLES (36)**.
R (e)Turn the rotary arm (34) 180 deg clockwise.
R (f)Lift the carriage (31) until it supports the fire-extinguisher bottle (2).
R (g)Install the gripping device (33) on the **DEVICE - REMOVAL INSTALLATION, FIRE EXTINGUISHER (35)**.
R (h)Install the belt (32) on the fire-extinguisher bottle (2) to safety the fire-extinguisher bottle (2).
R (i)Removal of the Lift Fixture:
R 1 Disengage the pins (27).
R 2 Disengage the hooks (29) from the fire-extinguisher bottle (2) and remove the lift fixture (28).
R (j)Move the carriage (31) outboard until you can install the fire-extinguisher bottle (2).
R (k)Position extinguisher bottle (2) on airframe structure and install bolts (11) and new nuts (1).
R (l)Position eye-end of support strut (9) onto attachment lug of bottle (2).
R (m)If adjustment of support strut is necessary, proceed as follows:
1 Bend open lockwasher (22), slacken locknut (21) and remove eye-end (20). Discard lockwasher (22).
2 Install eye-end (20) using new lockwasher (22).
3 Rotate eye-end (20) until bolt (10) can be fitted through eye-end (20) and attachment lug of bottle (2).
4 Tighten locknut (21) and safety by bending lugs of lockwasher (22).
R (n)Install bolt (10) and new nut (12).
R (o)Remove the belt (32) and the **DEVICE - INSTALLATION, FIRE EXTINGUISHER (35)**.
(p)Remove blanking caps and connect hose (13) to bottle (2).

(2)Outlet Valve

** On Fire Extinguisher Bottle 1

(a)Remove pressure holding blanking cap from discharge head orifices on extinguisher bottle (2).
(b)Fit new O-ring (19) to outlet valve (7).
R (c)Install swivel rings (15) or O-rings (18) and filters (14) on outlet valves (7).

R NOTE : Install swivel rings (15) on outlet valves (7) using mineral grease (Material No. 04-001).

(d)Install outlet valves (7) with nuts (8). Do not tighten nuts (8).
(e)Remove blanking caps, connect and tighten hoses (5) to outlet valves (7).
(f)TORQUE nuts (8) to between 6.1 and 7.5 m.daN (540 and 664 lbf.in.).
(g)Safety nuts (8) with lockwire 0.8 mm (0.03 in.) dia.

** On Fire Extinguisher Bottle 2

CAUTION : WHEN OPENING PIPES, MAKE CERTAIN THAT NO WATER, OIL ETC PENETRATES INTO OPEN CONNECTIONS.
(a)Remove pressure holding blanking cap from discharge head orifices on extinguisher bottle (2).
(b)Fit new O-rings (18),(19) to outlet valves (7).
R (c)Install filters (14) on outlet valves (7).
(d)Install outlet valves (7) with nuts (8). Do not tighten nuts (8).
(e)Remove blanking caps, connect and tighten pipes (5) to outlet valves (7).
(f)TORQUE nuts (8) to between 6.1 and 7.5 m.daN (540 and 664 lbf.in.).
(g)Safety nuts (8) with lockwire 0.8 mm (0.03 in.) dia.

** On Fire Extinguisher Bottles 1 and 2

(h)Remove blanking caps and connect electrical connector (3) to pressure switch (4).
(i)Install discharge cartridge (16) with O-ring (19), bonding strap (17) and electrical connector (6) (Ref. 26-23-12, P. Block 401).

**ON A/C 001-100, 105-200,

Post SB 26-2027 For A/C 001-100,105-200,

D. Installation

R WARNING : BE VERY CAREFUL WHEN YOU MOVE A FILLED FIRE EXTINGUISHER
R BOTTLE. A HEAVY SHOCK COULD CAUSE UNWANTED DISCHARGE AND INJURY
R TO PERSONS.

R NOTE : Two mechanics are necessary to install the fire-extinguisher
R bottle.

NOTE : Make sure that the measurement "X" 5 mm (0.2 in.) minimum between the tube and the extinguisher bottle is given.

(1)Fire Extinguisher Bottles

** On Fire Extinguisher Bottles 1 and 2

R (a)Put the fire-extinguisher bottle (2) in position with the **TROLLEY - FIRE EXTINGUISHER BOTTLES (36)**.
R (b)Remove the belt (37) from the fire-extinguisher bottle (2).
R (c)Installation of the Lift Fixture:
R 1 Engage the hooks (29) of the lift fixture (28) on the fire-extinguisher bottle (2).
R 2 Attach the lift fixture (28) to the fire-extinguisher bottle (2) with the pins (27).
R (d)Lift the fire-extinguisher bottle (2) with the chain (30) from the **TROLLEY - FIRE EXTINGUISHER BOTTLES (36)** until it is free from the **TROLLEY - FIRE EXTINGUISHER BOTTLES (36)**.
R (e)Turn the rotary arm (34) 180 deg clockwise.
R (f)Lift the carriage (31) until it supports the fire-extinguisher bottle (2).
R (g)Install the gripping device (33) on the **DEVICE - REMOVAL INSTALLATION, FIRE EXTINGUISHER (35)**.
R (h)Install the belt (32) on the fire-extinguisher bottle (2) to safety the fire-extinguisher bottle (2).
R (i)Removal of the Lift Fixture:
R 1 Disengage the pins (27).
R 2 Disengage the hooks (29) from the fire-extinguisher bottle (2) and remove the lift fixture (28).
R (j)Move the carriage (31) outboard until you can install the fire-extinguisher bottle (2).
R (k)Position extinguisher bottle (2) on airframe structure and install bolts (11) and new nuts (1).
R (l)Position eye-end of support strut (9) onto attachment lug of bottle (2).
R (m)If adjustment of support strut is necessary, proceed as follows:
1 Bend open lockwasher (22), slacken locknut (21) and remove eye-end (20). Discard lockwasher (22).
2 Install eye-end (20) using new lockwasher (22).
3 Rotate eye-end (20) until bolt (10) can be fitted through eye-end (20) and attachment lug of bottle (2).
4 Tighten locknut (21) and safety by bending lugs of lockwasher (22).
R (n)Install bolt (10) and new nut (12).
R (o)Remove the belt (32) and the **DEVICE - REMOVAL INSTALLATION, FIRE EXTINGUISHER (35)**.
R (p)Remove blanking caps and connect hose (13) to bottle (2).

(2)Outlet Valve

** On Fire Extinguisher Bottle 1

(a)Remove pressure holding blanking cap from discharge head orifices on extinguisher bottle (2).
(b)Fit new O-rings (19) to outlet valve (7).
R (c)Install swivel rings (15) or O-rings (18) and filters (14) on outlet valves (7).

R NOTE : Install swivel rings (15) on outlet valves (7) using mineral

grease (Material No. 04-001).

(d)Install outlet valves (7) with nuts (8). Do not tighten nuts (8).
(e)Remove blanking caps, connect and tighten hoses (5) to outlet valves (7).
(f)TORQUE nuts (8) to between 6.1 and 7.5 m.daN (540 and 664 lbf.in.).
(g)Safety nuts (8) with lockwire 0.8 mm (0.03 in.) dia.

** On Fire Extinguisher Bottle 2

CAUTION : WHEN OPENING PIPES, MAKE CERTAIN THAT NO WATER, OIL ETC PENETRATES INTO OPEN CONNECTIONS.
(a)Remove pressure holding blanking cap from discharge head orifices on extinguisher bottle (2).
(b)Fit new O-rings (18),(19) to outlet valves (7).
R (c)Install filters (14) on outlet valves (7).
(d)Install outlet valves (7) with nuts (8). Do not tighten nuts (8).
(e)Remove blanking caps, connect and tighten pipes (5) to outlet valves (7).
(f)TORQUE nuts (8) to between 6.1 and 7.5 m.daN (540 and 664 lbf.in.).
(g)Safety nuts (8) with lockwire 0.8 mm (0.03 in.) dia.

** On Fire Extinguisher Bottles 1 and 2

(h)Remove blanking caps and connect electrical connector (3) to pressure switch (4).
(i)Install discharge cartridge (16) with O-ring (19), bonding strap (17) and electrical connector (6) (Ref. 26-23-12, P. Block 401).

**ON A/C ALL

E. Test
(1)Remove safety clips and tags and close circuit breakers 1WM and 2WM.
(2)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(3)Make certain that electronics racks ventilation is correct.
(4)On panel 433VU, check that DISCH 1 and DISCH 2 lights 3WM are off.
(5)On panel 471VU, press SYS TEST P/BSW 18WM and check that OK lights BTL1 and BTL2 come on.

F. Close-Up
(1)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.
(2)Install sidewall panels (Ref. 25-54-10, P. Block 201).
(3)Remove door actuator safety lock (Ref. 52-30-00, P. Block 301).
(4)Close FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(5)Remove acccess platform.
(6)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).

DISCHARGE CARTRIDGE - REMOVAL/INSTALLATION

WARNING : BEFORE POWER IS SUPPLIED TO THE AIRCRAFT, MAKE CERTAIN THAT ELECTRICAL CIRCUITS UPON WHICH WORK IS IN PROGRESS ARE ISOLATED.

R

WARNING : CARTRIDGE ELECTRICAL CONNECTOR PINS MUST BE SHUNTED WHENEVER HANDLING CARTRIDGE.

1. Reasons for the Job

A. Removal of fire extinguisher bottle.

B. Removal due to reaching time between scheduled replacement.

C. Replacement after discharge or failure of squib test.

2. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 2.5 m (8 ft.) |
| B. | Torque Wrench, up to 1.7 m.daN (150 lbf.in.) |
| C. | Blanking Caps |
| D. 10-101950-81 | Shunt Plug |
| E. | Circuit Breaker Safety Clips and Tags |
| F. | Lockwire, Corrosion-Resistant Steel, Dia. 0.5 mm (0.02 in.) |
| G. | Lockwire, Corrosion-Resistant Steel, Dia. 0.8 mm (0.032 in.) |
| H. | O-Rings |

Referenced Procedures

| | |
|---|---|
| - 20-28-11, P. Block 1 | Electrical Bonding |
| - 24-41-00, P. Block 301 | AC External Power Control |
| - 25-54-10, P. Block 201 | FWD Cargo Compartment Linings |
| - 52-30-00, P. Block 1 | Cargo Compartment Doors |
| - 52-30-00, P. Block 301 | FWD and AFT Cargo Compartment Doors |

3. Procedure

A. Job Set-Up

(1)Position access platform.

(2)Open FWD cargo compartment door (Ref. 52-30-00, P. Block 1).

(3)Install door actuator safety lock to FWD cargo compartment door actuator (Ref. 52-30-00, P. Block 301).

(4)Remove RH sidewall panels between FR26 and FR34 (Ref. 25-54-10, P. Block 201).

(5)Open, safety and tag the following circuit breakers:

| PANEL | SERVICE | IDENT. | LOCATION |
|---|---|---|---|
| 22VU | FIRE EXTING/CARGO COMPT/BTL 1 | 1WM | 207/C17 |
| 22VU | FIRE EXTING/CARGO COMPT/BTL 2 | 2WM | 207/C18 |

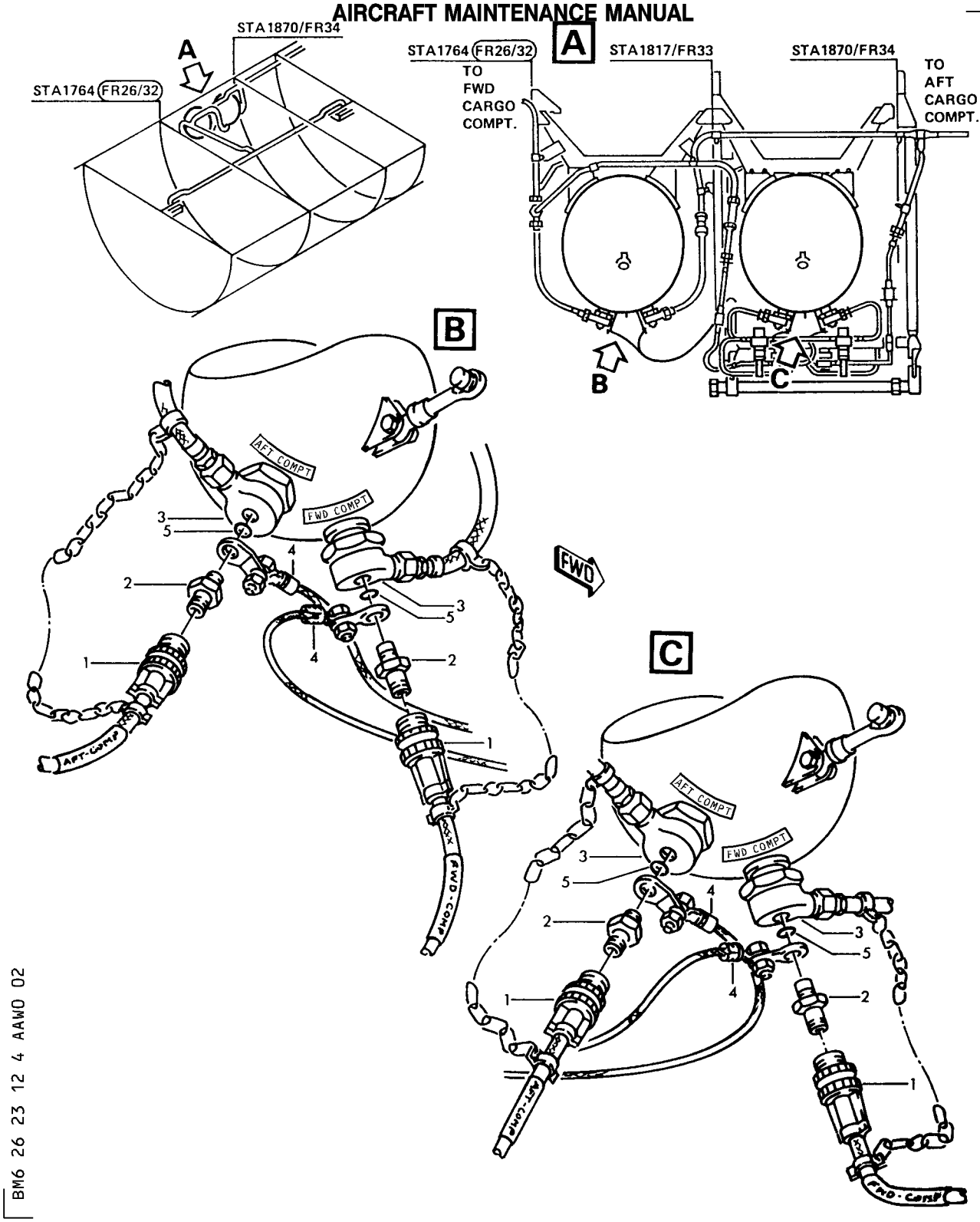
B. Removal
(Ref. Fig. 401)
(1)Cut and remove lockwire. Disconnect electrical connector (1) from discharge cartridge (2). Fit blanking cap to electrical connector (1).
(2)Install shunt plug PN 10-101950-81 to electrical connector of discharge cartridge (2).
(3)Cut and remove lockwire. Remove discharge cartridge (2) and bonding strap (4).
(4)On outlet valves (3) of fire extinguisher bottle 2:
- Remove and discard O-ring (5).
(5)If installed, remove and discard O-ring (5) on outlet valves (3) of fire extinguisher bottle 1.

C. Preparation of Replacement Component
(1)Examine bonding strap connections for serviceability.
CAUTION : THE SERVICE LIFE OF THE CARTRIDGE, AS INDICATED BY THE DATE, MUST EXTEND TO THE NEXT SCHEDULED INSPECTION. IF THIS CONDITION IS NOT SATISFIED, REPLACE CARTRIDGE.
(2)Check the manufacturing date on the replacement cartridge. Make sure that the maximum combination storage plus service life limit will extend to the next scheduled inspection and in accordance with vendor recommendation
NOTE : The manufacturing date is stamped on body of the cartridge.

D. Installation
(1)Install new O-ring (5) to outlet valve (3).
(2)Install bonding strap (4) on discharge cartridge (2) (Ref. 20-28-11, P. Block 1).
(3)Install discharge cartridge (2) to outlet valve (3).
R (4)TORQUE discharge cartridges to between 1.02 and 1.13 m.daN (90.3 and
R 100 lbf.in.) and safety cartridge with lockwire 0.8 mm (0.032 in).
(5)Remove shunt plug from discharge cartridge (2).
WARNING : SQUIB ELECTRICAL RECEPTACLES AND AIRCRAFT ELECTRICAL CONNECTORS MUST BE CLEAN AND FREE FROM FOREIGN PARTICLES.
CAUTION : MAKE CERTAIN THAT YOU CONNECT THE ELECTRICAL CONNECTORS "FWD-COMP" AND "AFT-COMP" TO THE CORRESPONDING DISCHARGE CARTRIDGE.
(6)Remove blanking cap and connect electrical connector (1) to discharge cartridge (2).
(7)Safety electrical connector with lockwire 0.5 mm (0.02 in.).

E. Test
(1)Remove safety clips and tags and close circuit breakers 1WM and 2WM.
(2)Connect electrical ground power unit and energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(3)Make certain that electronics racks ventilation is correct.
(4)On panel 433VU, check that lights DISCH1 and DISCH2 (3WM) are off.
(5)On panel 471VU, press P/BSW SQUIB TEST (18WM) and check that OK lights BTL1 and BTL2 come on.

F. Close-Up
(1)Make certain that work area is clean and clear of tools and miscella-




Discharge Cartridge
Figure 401

R

neous items of equipment.
(2)Install RH sidewall panels between FR26/32 and FR34 (Ref. 25-54-10, P. Block 201).
(3)Remove door actutor safety lock (Ref. 52-30-00, P. Block 301).
(4)Close FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(5)Remove access platform.
(6)De-energize the aircraft electrical network and disconnect electrical ground power unit (Ref. 24-41-00, P. Block 301).

## WATER ADSORBING AND SOLID PARTICLE FILTER - SERVICING

WARNING : THE DISCHARGED EXTINGUISHING AGENT EXPELS OXYGEN FROM THE SURROUNDING AREA. THE WORK AREA MUST BE VENTILATED IN CASE THE EXTINGUISHING AGENT IS DISCHARGED INADVERTENTLY.

CAUTION : A HYGROSCOPIC MOLECULAR SIEVE IS INSERTED IN THE WATER ADSORBING FILTER (PAINTED GREEN, FIRST FILTER AFTER BOTTLE CONNECTION). MAKE CERTAIN THAT THE MOLECULAR SIEVE IS NOT EXPOSED TO THE AIR HUMIDITY LONGER THAN NECESSARY. THE FILTER MUST BE CLOSED AGAIN IF THE WORK SHOULD BE INTERRUPTED.

CAUTION : MAKE CERTAIN THAT NO WATER, OIL ETC PENETRATES INTO OPEN CONNECTIONS.

1. Reasons for the Job

A. Replacement of the filter elements.

B. Cleaning after activation.

2. Equipment and Materials

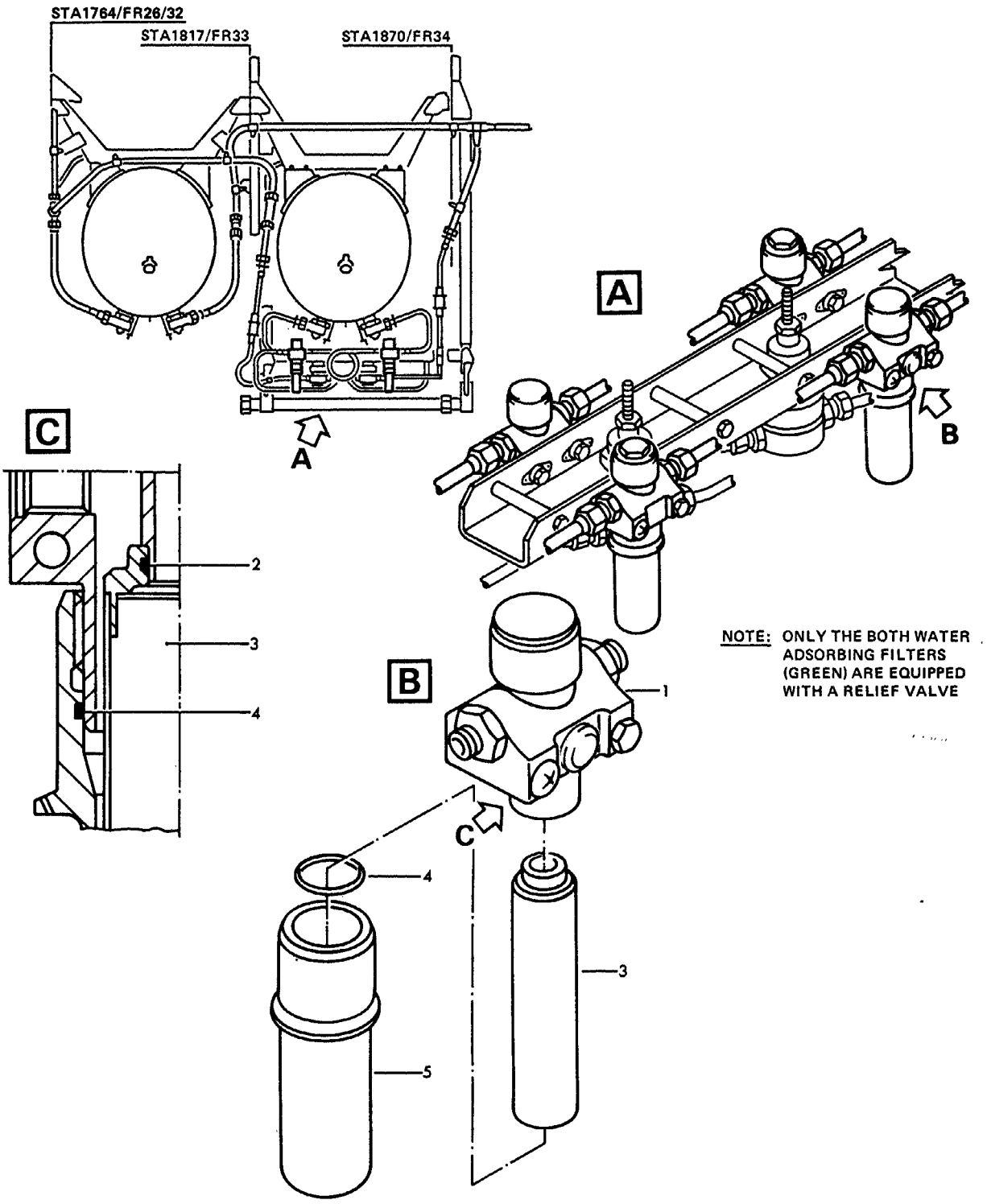
| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform |
| B. | Lockwire, Corrosion-Resistant Steel, Dia. 0.8 mm (0.032 in.) |
| C. | O-Ring |
| D. Material No. 11-004 | Cleaning Agents (Ref. 20-31-00) |
| Referenced Procedures | |
| - 25-54-10, P. Block 201 | Sidewall Panels |
| - 52-30-00, P. Block 1 | FWD and AFT Cargo Compartment Doors |
| - 52-30-00, P. Block 301 | Cargo Compartment Door Actuator |

3. Procedure
(Ref. Fig. 301)

A. Job Set-Up
(1)Position access platform.
(2)Open FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(3)Install door actuator safety lock to FWD cargo compartment door actuator (Ref. 52-30-00, P. Block 301).
(4)Remove RH sidewall panels from STA1817/FR33 to STA1870/FR34 (Ref. 25-54-10, P. Block 201).

NOTE : Removal and installation of both the filter element of the water adsorbing filter (green) and of the solid particle filter is similar.

NOTE : An overpressure valve is installed on the water adsorbing filter (green) only.




Water Adsorbing and Solid Particle Filter
Figure 301

B. Removal
(1)Remove filter element as follows:
(a)Cut and remove lockwire between filter head (1) and bowl (5).
(b)Unscrew bowl (5).
(c)Remove filter element (3) and discard.
(d)Remove and discard O-ring (4).

C. Preparation for Installation
(1)Clean filter head (1) and bowl (5) with cleaning agent (Material No. 11-004).
(2)Wipe dry cleaned components with a clean lint-free cloth.
(3)Examine filter head (1) and bowl (5) for serviceability.

D. Installation
(1)Install filter element as follows:
(a)Install new O-ring (4) to bowl (5).
(b)Insert new filter element (3) in bowl (5).
(c)Position bowl (5) and filter element (3) to filter head (1).
(d)Hand-tighten bowl (5) to filter head (1) and safety with lockwire 0.8 mm (0.032 in.).

E. Close-Up

R
R (1)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.
R (2)Install sidewall panels (Ref. 25-54-10, P. Block 201).
R (3)Remove door actuator safety lock (Ref. 52-30-00, P. Block 301).
R (4)Close FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
R (5)Remove access platform.

## WATER ADSORBING AND SOLID PARTICLE FILTER - REMOVAL/INSTALLATION

WARNING : MAKE CERTAIN THAT WARNING NOTICES ARE IN CORRECT POSITION TO PREVENT INADVERTENT ACTUATION OF THE FIRE EXTINGUISHING SYSTEM.

WARNING : THE DISCHARGED EXTINGUISHING AGENT EXPELS OXYGEN FROM THE SURROUNDING AREA. THE WORK AREA MUST BE VENTILATED IN CASE THE EXTINGUISHING AGENT IS DISCHARGED INADVERTENTLY.

CAUTION : A HYGROSCOPIC MOLECULAR SIEVE IS INSERTED IN THE WATER ADSORBING FILTER (PAINTED GREEN, FIRST FILTER AFTER BOTTLE CONNECTION). MAKE CERTAIN THAT THE MOLECULAR SIEVE IS NOT EXPOSED TO THE AIR HUMIDITY LONGER THAN NECESSARY. THE FILTER MUST BE CLOSED AGAIN IF THE WORK SHOULD BE INTERRUPTED.

CAUTION : WHEN DISCONNECTING PIPES, MAKE CERTAIN THAT NO WATER, OIL ETC. PENETRATES INTO OPEN CONNECTIONS.

### 1. Reason for the Job

A. Replacement of the complete filter assembly.

### 2. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 2.5 m (8 ft.) |
| B. | Blanking Caps |

Referenced Procedures

| | |
|---|---|
| - 25-54-10, P. Block 201 | FWD Cargo Compartment Linings |
| R - 26-23-00, P. Block 501 | Cargo Compartment Fire Extinguishing |
| - 26-23-13, P. Block 301 | Water Adsorbing and Solid Particle Filter |
| - 52-30-00, P. Block 1 | Cargo Compartment Doors |
| - 52-30-00, P. Block 301 | FWD and AFT Cargo Compartment Doors |

### 3. Procedure

(Ref. Fig. 401)

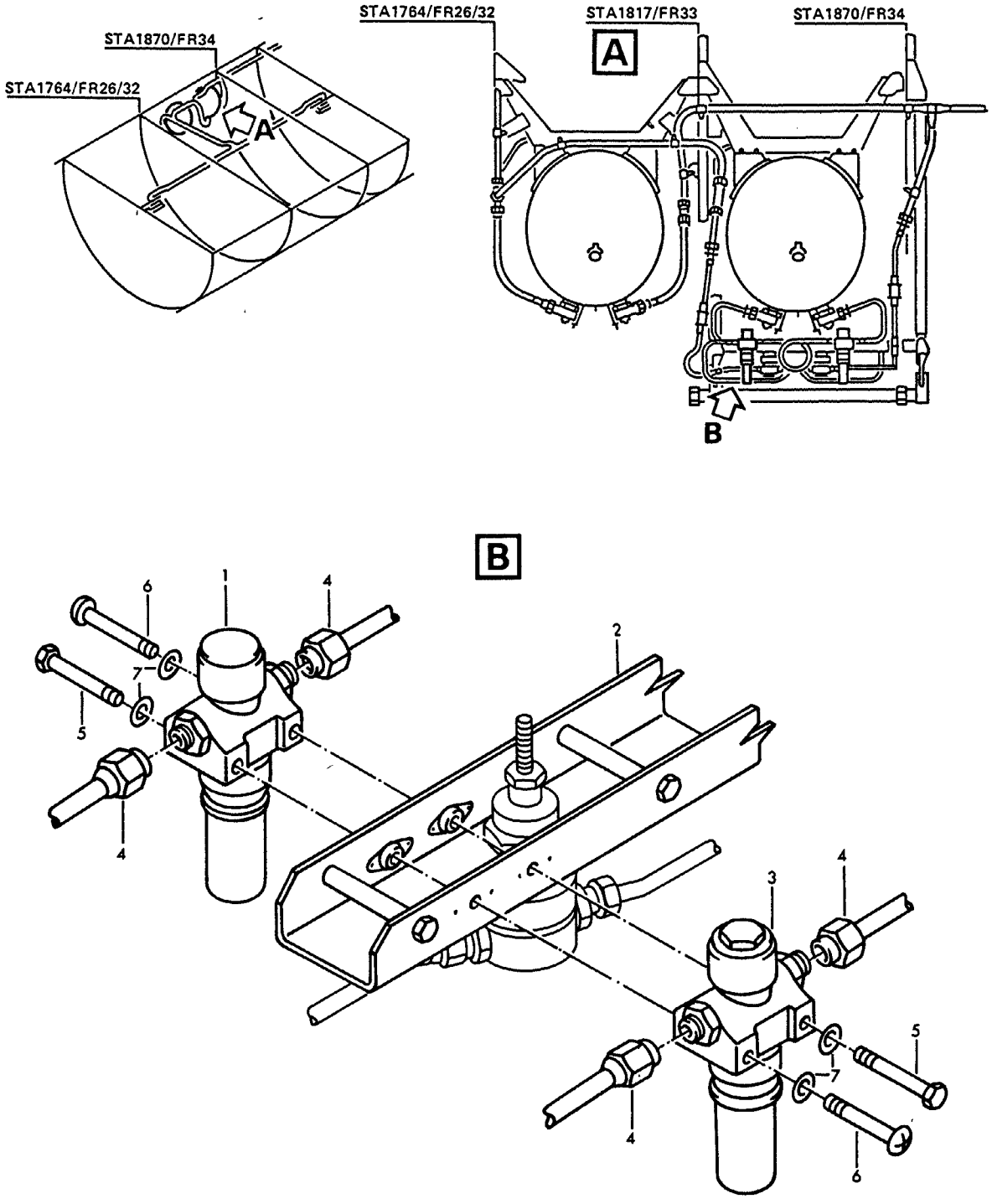
A. Job Set-Up

(1)Position access platform.
(2)Open FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(3)Install door actuator safety lock to FWD cargo compartment door actuator (Ref. 52-30-00, P. Block 301).
(4)Remove RH sidewall panels from STA1817/FR33 to STA1870/FR34 (Ref. 25-54-10, P. Block 201).

B. Removal

NOTE : Removal and installation of both filter types, the water adsorbing filter (green) and the solid particle filter, is similar.

(1)Slacken nuts (4) and disconnect pipes from filter (1) and/or (3).
(2)Remove bolt (5), screw (6) and washers (7) and remove filter (1) and/or (3) from support strut (2).
(3)Fit blanking caps.




Water Adsorbing and Solid Particle Filter
Figure 401

C. Preparation for Installation

CAUTION : AFTER ACTIVATION OF THE FIRE EXTINGUISHING SYSTEM AND DISCHARGE OF THE FIRE EXTINGUISHING BOTTLES, DISASSEMBLY AND CLEANING OF THE FILTER IS NECESSARY.

(1)If necessary, replace filter element (Ref. 26-23-13, P. Block 301).

D. Installation

NOTE : Note flow direction during installation.

(1)Position filter (1) and/or (3) to support strut (2) and install bolt (5) and screw (6) with washers (7). Tighten bolt (5) and screw (6).

(2)Remove blanking caps and connect pipes to filter.

(3)Tighten nuts (4).

E. Test

(1)Perform functional flow test and leak test on the cargo compartment

R fire extinguishing lines (Ref. 26-23-00, P. Block 501).

F. Close-Up

(1)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.

(2)Install sidewall panels (Ref. 25-54-10, P. Block 201).

(3)Remove door actuator safety lock (Ref. 52-30-00, P. Block 301).

(4)Close FWD cargo compartment door (Ref. 52-30-00, P. Block 1).

(5)Remove access platform.

R PRESSURE REDUCING VALVE 260202- REMOVAL/INSTALLATION

WARNING : MAKE CERTAIN THAT WARNING NOTICES ARE IN CORRECT POSITION TO PREVENT INADVERTENT ACTUATION OF THE FIRE EXTINGUISHING SYSTEM.
WARNING : THE DISCHARGED EXTINGUISHING AGENT EXPELS OXYGEN FROM THE SURROUNDING AREA. THE WORK AREA MUST BE VENTILATED IN CASE THE EXTINGUISHING AGENT IS DISCHARGED INADVERTENTLY.
CAUTION : WHEN DISCONNECTING PIPES, MAKE CERTAIN THAT NO WATER, OIL ETC. PENETRATES INTO OPEN CONNECTIONS.

1. Reason for the Job

A. Replacement of the pressure reducing valve.

2. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 2.5 m (8 ft.) |
| B. | Blanking Caps |

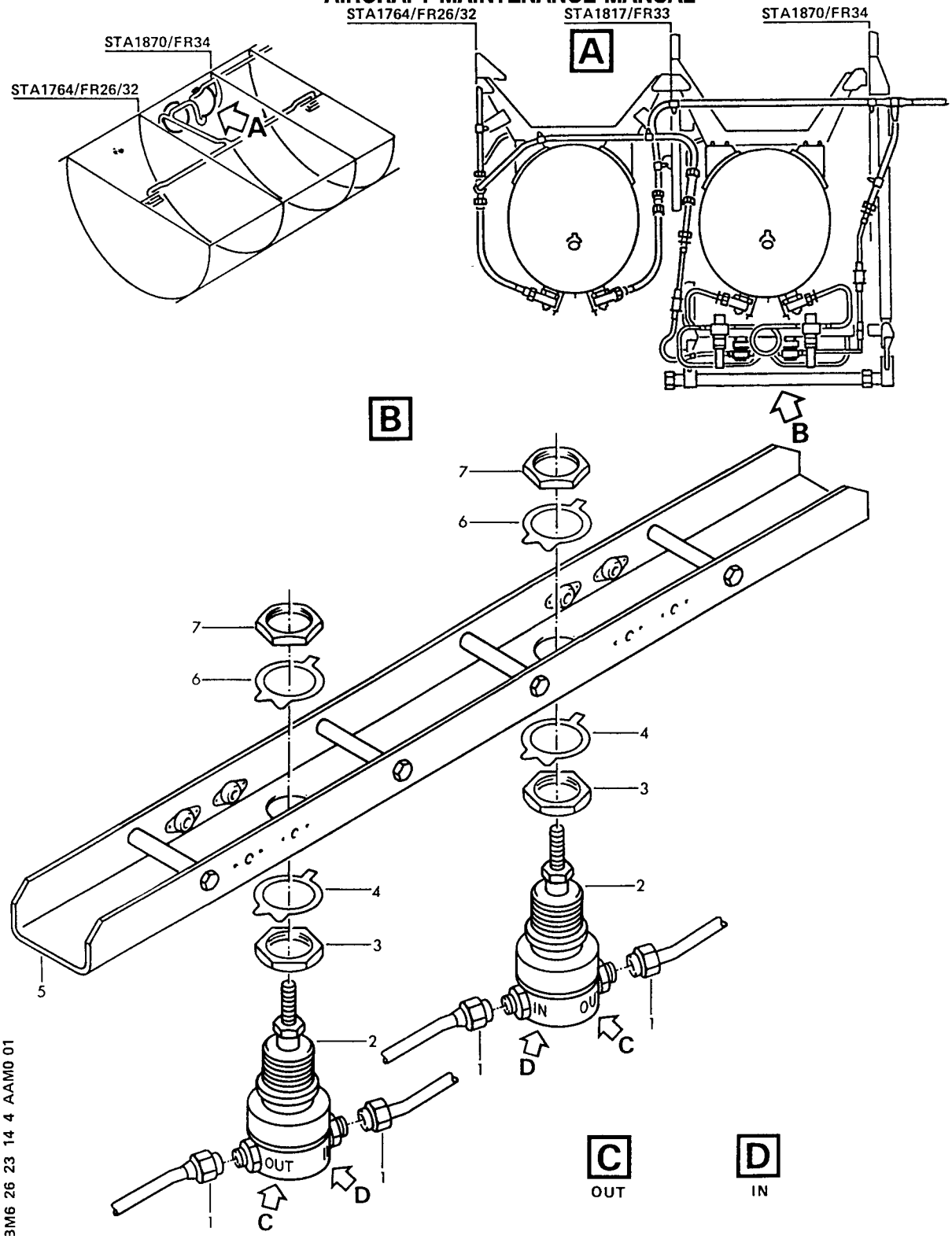
Referenced Procedures

| | |
|---|---|
| - 25-54-10, P. Block 201 | FWD Cargo Compartment Linings |
| - 26-23-00, P. Block 501 | Cargo Compartment Fire Extinguishing |
| - 52-30-00, P. Block 1 | Cargo Compartment Doors |
| - 52-30-00, P. Block 301 | FWD and AFT Cargo Compartment Doors |

3. Procedure
(Ref. Fig. 401)

A. Job Set-Up
(1)Position access platform.
(2)Open FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(3)Install door actuator safety lock to FWD cargo compartment door actuator (Ref. 52-30-00, P. Block 301).
(4)Remove RH sidewall panels from STA1923/FR29 to STA2029/FR31 (Ref. 25-54-10, P. Block 201).

B. Removal
(1)Slacken nuts (1) and disconnect pipes from valve (2).
(2)Unlock nut (7) and remove nut (7) and lockwasher (6).
(3)Remove valve (2) from support strut (5).
(4)Fit blanking caps.
(5)Remove lockwasher (4) and nut (3) from valve (2).
(6)Discard lockwashers (4),(6).




Pressure Reducing Valve
Figure 401

R

C. Preparation for Installation
(1)Examine pressure reducing valve for serviceability.

D. Installation

R CAUTION : DURING INSTALLATION OF THE PRESSURE REDUCING VALVE
R MAKE SURE THAT THE PRESSURE REDUCING VALVE IS CORRECTLY
R ORIENTATED (IN-OUT DIRECTION).

(1)Install nut (3) and new lockwasher (4) to valve (2).
NOTE : Make certain that distance between center of pipe connection and bottom of support strut is 41.5 ±1 mm (1.63 ±0.04 in.).
(2)Position valve (2) to support strut (5) and install new lockwasher (6) and nut (7). Do not tighten nut (7) at this stage.
(3)Align valve connections to pipes.
(4)Remove blanking caps and connect pipes to valve (2).
(5)Tighten nuts (1).
(6)Tighten nuts (3),(7) and secure with lockwashers (4),(6).

E. Test
(1)Perform Functional Flow Test and Leak Test on the Cargo Compartment Fire Extinguishing Lines (Ref. 26-23-00, P. Block 501).

F. Close-Up
(1)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.
(2)Install sidewall panels (Ref. 25-54-10, P. Block 201).
(3)Remove door actuator safety lock (Ref. 52-30-00, P. Block 301).
(4)Close FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(5)Remove access platform.

WARNING : MAKE CERTAIN THAT WARNING NOTICES ARE IN CORRECT POSITIONS TO PREVENT INADVERTENT ACTUATION OF THE FIRE EXTINGUISHING SYSTEM.
CAUTION : WHEN DISCONNECTING PIPES, MAKE CERTAIN THAT NO WATER, OIL ETC. PENETRATES INTO OPEN CONNECTIONS.

1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 2.5 m (8 ft.) |
| B. | Torque wrench, 6.8 m.daN (50 lbf.ft.) |
| C. | Blanking Caps |
| D. | Lint-free Cloth |
| E. | Lockwire, Corrosion-Resistant Steel, Dia. 0.8 mm (0.032 in.) |
| F. Material No. 11-002 | Cleaning Agents (Ref. 20-31-00) |

Referenced Procedures

| | |
|---|---|
| - 25-54-10, P. Block 201 | FWD Cargo Compartment Linings |
| - 26-23-00, P. Block 501 | Cargo Compartment Fire Extinguishing |
| - 52-30-00, P. Block 1 | Cargo Compartment Doors |
| - 52-30-00, P. Block 301 | FWD and AFT Cargo Compartment Doors |

2. Procedure
(Ref. Fig. 201)

A. Job Set-Up
(1)Position access platform.
(2)Open FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(3)Install door actuator safety lock to FWD cargo compartment door actuator (Ref. 52-30-00, P. Block 301).
(4)Remove RH sidewall panels from between STA1923/FR29 and STA2029/FR31 (Ref. 25-54-10, P. Block 201).

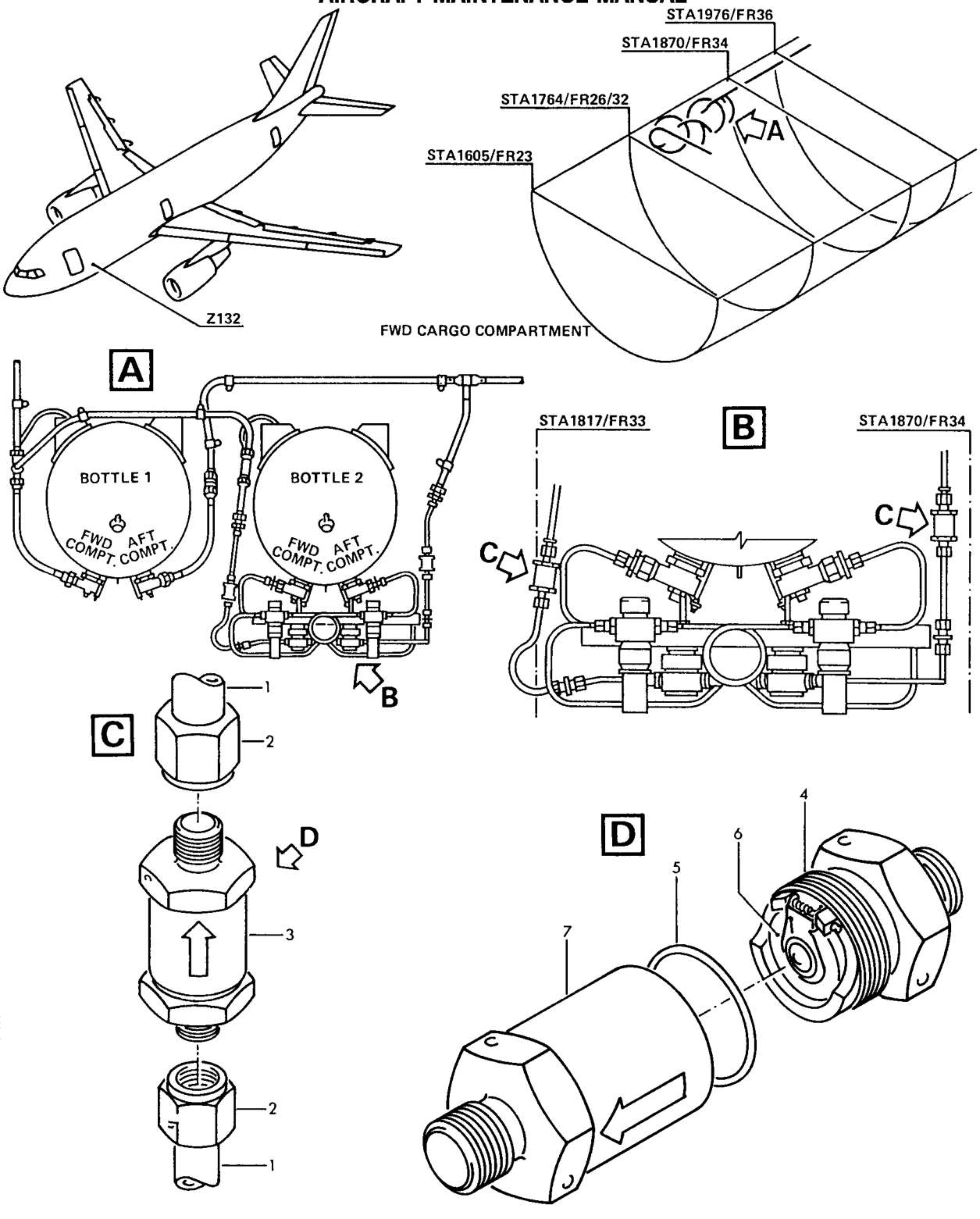
B. Removal
(1)Loosen nuts (2) and disconnect pipes (1) from check valve (3).
(2)Install blanking caps on pipes.

C. Disassembly

R
R (1)Remove cap (7) and gasket (5) from valve assembly (4).

D. Cleaning
(1)Clean valve assembly (4) and cap (7) with white spirit (Material No. 11-002).
(2)Dry cleaned surfaces with lint-free cloth or clean, dry, compressed air.

E. Test
(1)Hold valve assembly (4) in vertical position and put swing element (6)




BM6 26 23 15 2 AAMO 01

Check Valve
Figure 201

R

in down position.
(2)Make sure that swing element (6) is in closed position.
(3)Make sure that the swing element is centrally located and contacts the seating surface evenly.
(4)Move the valve assembly (4) up and down and make sure that swing element (6) moves freely without binding.

F. Assembly
(1)Install gasket (5) to valve assembly (4).
(2)Connect cap (7) to valve assembly (4).
R (3)TORQUE cap (4) to 6.1 ± 0.7 m.daN (45 ± 5 lbf.ft.).

G. Installation
CAUTION : MAKE CERTAIN THAT YOU INSTALL THE CHECK VALVE WITH THE FLOW IN THE CORRECT DIRECTION.
(1)Remove blanking caps.
(2)Put check valve (3) in position.
(3)Connect pipes (1) and tighten nuts (2).

H. Test
(1)Perform Functional Flow Test and Leak Test on Cargo Compartment Fire Extinguishing Lines (Ref. 26-23-00, P. Block 501).

I. Close-Up
(1)Make certain that work area is clean and clear of tools and miscelleaneous items of equipment.
(2)Install sidewall panels from between STA1923/FR29 and STA2029/FR31 (Ref. 25-54-10, P. Block 201).
(3)Remove door actuator safety lock (Ref. 52-30-00, P. Block 301).
(4)Close FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(5)Remove access platform.

# DIAPHRAGM - MAINTENANCE PRACTICES

**WARNING : MAKE CERTAIN THAT WARNING NOTICES ARE IN CORRECT POSITIONS TO PREVENT INADVERTENT ACTUATION OF THE FIRE EXTINGUISHING SYSTEM.**

**CAUTION : WHEN DISCONNECTING PIPES, MAKE CERTAIN THAT NO WATER, OIL ETC. PENETRATES INTO OPEN CONNECTIONS.**

## 1. Equipment and Materials

| ITEM | DESIGNATION |
|---|---|
| A. | Access Platform, 2.5 m (8 ft.) |
| B. | Blanking Caps |
| C. | Lint-free Cloth |
| D. Material No. 11-006 | Cleaning Agents (Ref. 20-31-00) |

Referenced Procedures

| | |
|---|---|
| - 25-54-10, P. Block 201 | FWD Cargo Compartment Linings |
| - 26-23-00, P. Block 501 | Cargo Compartment Fire Extinguishing |
| - 52-30-00, P. Block 1 | Cargo Compartment Doors |
| - 52-30-00, P. Block 301 | FWD and AFT Cargo Compartment Doors |

## 2. Procedure

(Ref. Fig. 201)

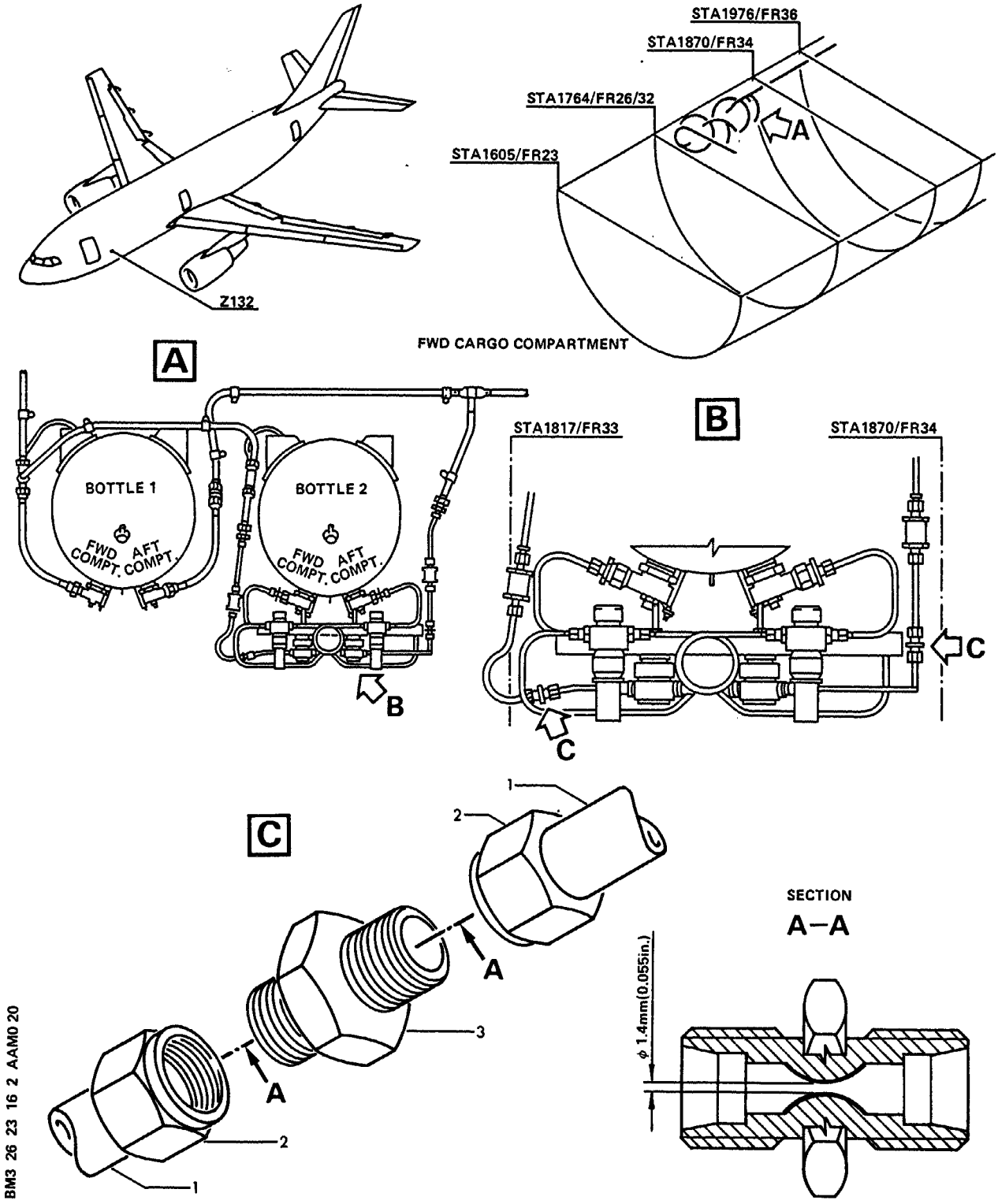
A. Job Set-Up
  (1)Position access platform.
  (2)Open FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
  (3)Install door actuator safety lock to FWD cargo compartment door actuator (Ref. 52-30-00, P. Block 301).
  (4)Remove RH sidewall panels from between STA1923/FR29 and STA2029/FR31 (Ref. 25-54-10, P. Block 201).

B. Removal
  (1)Loosen nuts (2) and disconnect pipes (1) from diaphragm (3).
  (2)Install blanking caps on pipes.

C. Inspection/Check
  (1)Make certain that diaphragm is clean.
  (2)If necessary, clean diaphragm with methyl alcohol (Mat. No. 11-006) and dry it with lint-free cloth or clean, dry, compressed air.
  (3)Use a drill to make certain that diameter of hole is 1.4 mm (0.055 in.).

D. Installation
  (1)Remove blanking caps.
  (2)Put diaphragm (3) in position.
  (3)Connect pipes (1) and tighten nuts (2).

E. Test
  (1)Perform Functional Flow Test and Leak Test on the Cargo Compartment
R Fire Extinguishing Lines (Ref. 26-23-00, P. Block 501).




Diaphragm
Figure 201

F. Close-Up
(1)Make certain that work area is clean and clear of tools and miscellaneous items of equipment.
(2)Install sidewall panels between STA1923/FR29 and STA2029/FR31, (Ref. 25-54-10, P. Block 201).
(3)Remove door actuator safety lock (Ref. 52-30-00, P. Block 301).
(4)Close FWD cargo compartment door (Ref. 52-30-00, P. Block 1).
(5)Remove access platform.

# PORTABLE FIRE EXTINGUISHERS - DESCRIPTION AND OPERATION

1. General
   The portable fire extinguishers provide a means of combating fire in the avionics, flight, passenger and cargo compartments.

2. Description and Operation
   In the avionics compartment, one extinguisher is fitted vertically on the forward LH side of the nose gear well.
   In the flight compartment, one extinguisher is fitted vertically on panel 121VU.
   In the passenger compartment, six to eight fire extinguishers are located in the utility areas and emergency exit areas in or near the attendant seats so that they are readily accessible for flight attendants.
   The extinguishers are retained in their stowage positions by quick-release clamps. Attached to each extinguisher are instructions for use, date of manufacture, date of expiry and weight.

## PORTABLE FIRE EXTINGUISHERS - INSPECTION/CHECK

1. Reason for the Job

A. Check pressure gage (pressure pointer in green band).

B. Check weight of portable Fire Extinguisher.

2. Inspection/Check

A. Inspect mounting bracket for condition and integrity.

B. Check instruction and control label for legibility.

C. Check that expiration date extends through the next scheduled inspection.

D. Check safety devices (seal wire, safety pin or safety lever) for integrity.

E. Check indicator disk, if fitted, is in place or seal is not destroyed.

F. Check that gage, if fitted, indicates an acceptable range.

G. Check that spray nozzle is free of obstructions.

H. Weight Check:
(1)Remove the Fire Extinguisher.
(2)Weigh the Fire Extinguisher.
(3)Check that the weight is in accordance with the manufacturers tolerance indicated on the control label.
(4)Install the Fire Extinguisher.

J. Hydrostatic Test:
(1)Remove and send the Fire Extinguisher to the manufacturer for a hydrostatic test.
(2)Install replaced Fire Extinguisher.

K. Close-Up
(1)Make certain that working area is clean, and clear of tools and miscellaneous items of equipment.

# LAVATORY FIRE EXTINGUISHING - DESCRIPTION AND OPERATION

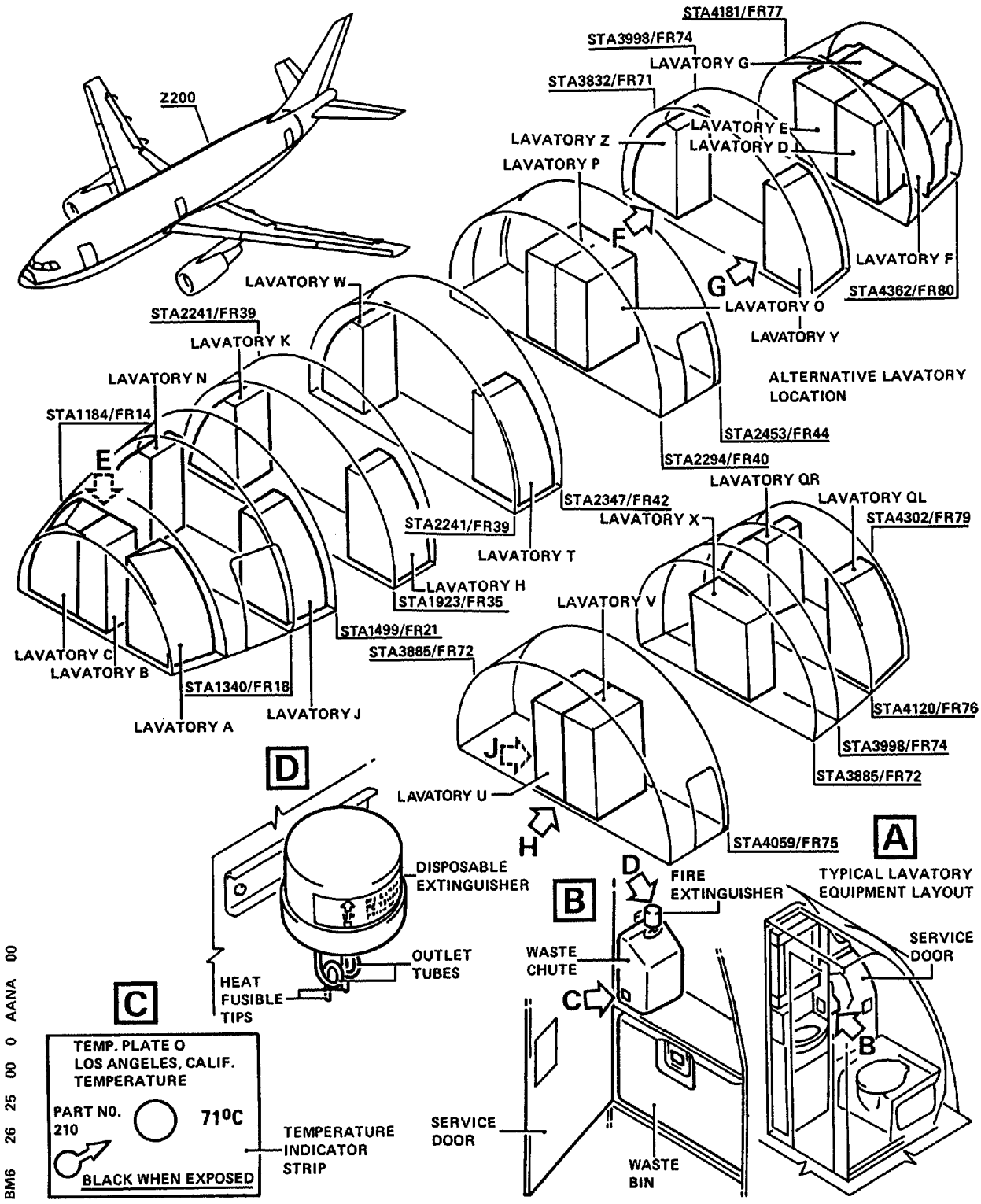
1. General
   A heat activated, automatic discharge fire extinguishing system is installed in each lavatory service cabinet. Any fire in the waste container will be contained within the confines of the metal waste bin and extinguished by flooding the bin compartment with an inert gas.
   Each lavatory extinguishing system is comprised of a disposable, self-actuated extinguisher bottle and temperature indicator.

2. Component Description
   (Ref. Fig. 001)

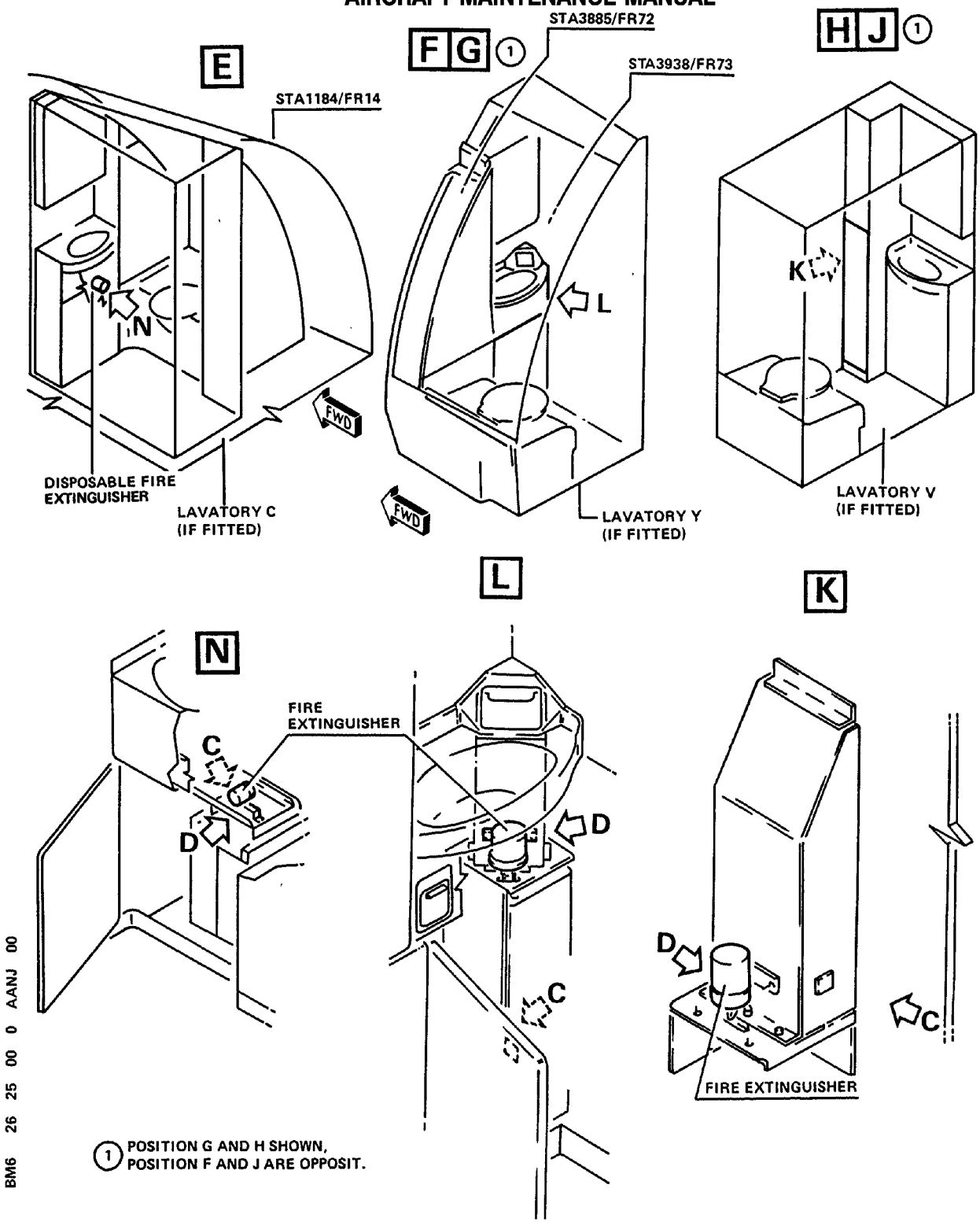
   A. Fire Extinguisher Bottle
      (1) The fire extinguisher bottle consists of a spherical steel container fitted with a mounting bracket and two outlet tubes, each having a heat fusible tip. The 2.5 inch (63.5 mm) diameter container is filled with approximately 120 grams of Halon FE 1301.
      (2) With the extinguisher bottle mounted inside the service cabinet, the outlet tubes are inserted through an opening in the waste chute and directed towards the waste bin.
      (3) Each bottle is labeled with date of manufacture, FE 1301 weight and total bottle weight.

   B. Temperature Indicator
      (1) A self-adhesive temperature indicator is located on each waste chute to provide a visual indication if excess temperatures have occurred in the waste bin area.
      (2) The temperature indicator has a grey disc that will change color to black when exposed to a temperature of approx. 71°C (160°F).

3. Operation
   A. The fire extinguishing system is completely automatic and self-contained. A fire or overheat condition, raising the ambient temperature to approximately 170°F (77°C) within the waste bin area, will cause the extinguisher bottle tips adhesive to melt, allowing the contents to discharge. The discharged FE 1301 is sufficient to cover 6 cu.ft. (0.17 $m^3$).




Lavatory Fire Extinguishing Component Location (Sheet 1/2)
Figure 001




Lavatory Fire Extinguishing Component Location (Sheet 2/2)
Figure 001

## LAVATORY FIRE EXTINGUISHER BOTTLE - MAINTENANCE PRACTICES

1. Reasons for the Job

A. Visual inspection of lavatory extinguisher bottles for evidence of leakage and / or damage

B. To make certain that the fire-extinguisher bottle is serviceable

2. Procedure

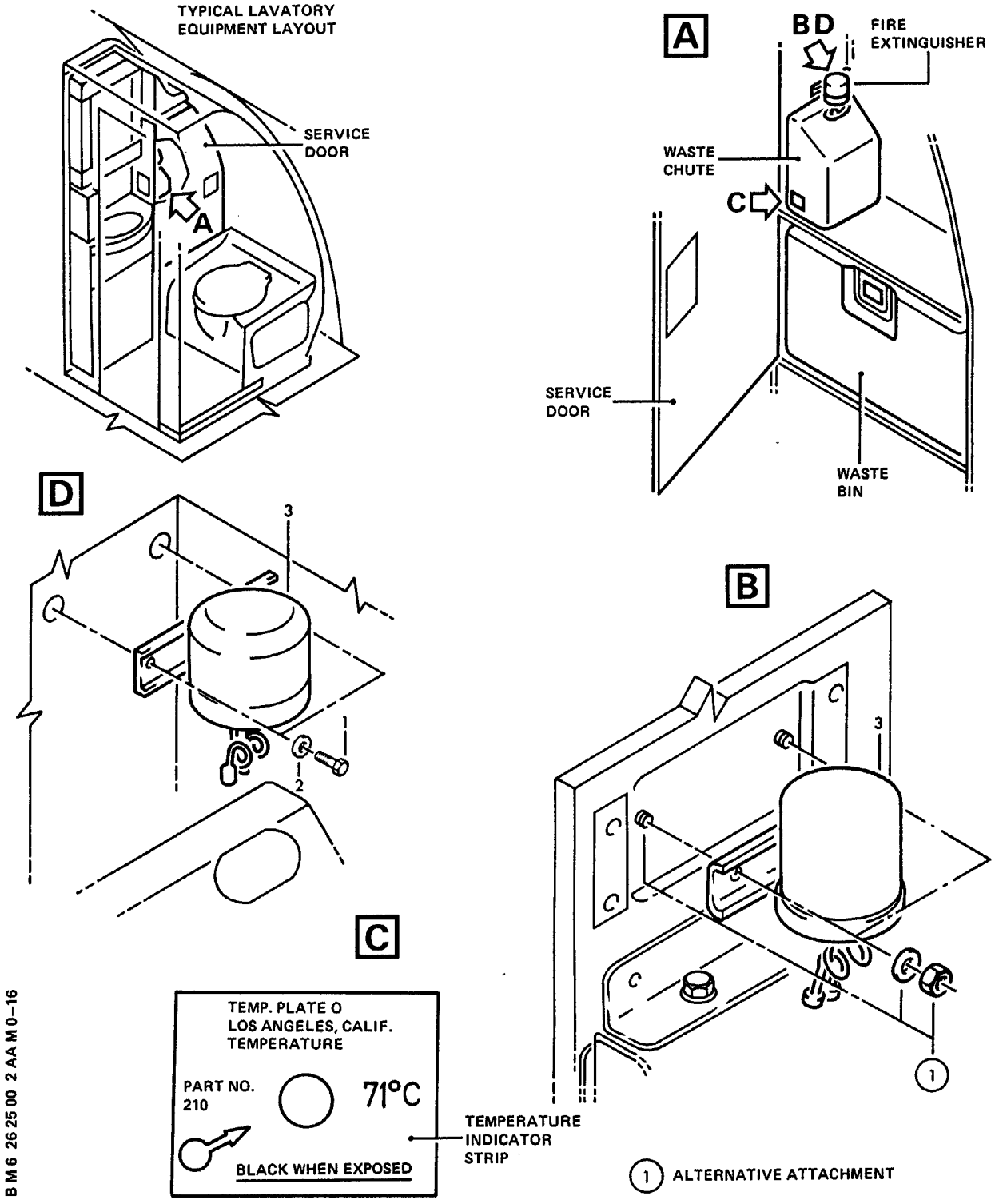
(Ref. Fig. 201)

A. Check temperature plate for exposure.
(1) Open service door.
(2) Check temperature plate, fitted to waste chute.
NOTE : If temperature-sensitive patch on temperature plate has changed from grey to black, check, (by weighing) if extinguisher bottle has been discharged.
(3) Replace temperature plate if exposed.

B. Make certain that serviceable heat fusible tips are installed at ends of discharge pipes.
NOTE : If heat fusible tips are not serviceable or missing, the extinguisher bottle must be replaced.

C. Weigh extinguisher bottle.
(1) Remove screws (1), washers (2) and extinguisher bottle (3).
NOTE : An alternative attachment method may be with washers and nuts to studs.
(2) Make certain that extinguisher bottle weight is not less than total weight recorded on manufacturer's nameplate minus 15 grams.
NOTE : Extinguisher bottle weight is measured without attachment screws and washers.
(3) Install checked or replacement bottle (3) with washers (2) and screws (1).
NOTE : An alternative attachment method may be with washers and nuts to studs.

D. Close-Up
(1) Make certain that working area is clean and clear of tools and miscellaneous items of equipment.
(2) Close service door.




Extinguisher Bottle and Temperature Plate
Figure 201